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EQUIPMENT OWNERS MANUAL
MATTHIESEN MAGIC FINGER BAGGER

OPERATION MANUAL INDEX

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INSPECTION REPORT

VISUAL:

CLEANLINESS:

DRUM ☐ PASS ☐ FAIL

EXTERIOR ☐ PASS ☐ FAIL

METAL FINISH (UNIFORM) ☐ PASS ☐ FAIL

DECALS: ☐ PASS ☐ FAIL

MECHANICAL:

ROTATION OF MOTOR ☐ PASS ☐ FAIL

LIMIT SWITCH ☐ PASS ☐ FAIL

TIMING OF DRUM ☐ PASS ☐ FAIL

MANUAL MODE AND AUTO ☐ PASS ☐ FAIL

CHAIN:

TENSION ☐ PASS ☐ FAIL

ALIGNMENT ☐ PASS ☐ FAIL

POWER CORD VOLT/AMP

SAME AS CONTROL BOX REQ.: ☐ PASS ☐ FAIL

CONFIRM VOLTAGE W/W.O.: ☐ PASS ☐ FAIL

FINAL INSPECTION:

DRY TEST RUN ☐ PASS ☐ FAIL

VISUAL ☐ PASS ☐ FAIL

FASTENERS FOR TIGHTNESS ☐ PASS ☐ FAIL

PROXIMITY SWITCH FUNCTION ☐ PASS ☐ FAIL

COMMENTS: _____

INSPECTED BY _____ DATE: _____

SERIAL NUMBER _____

Brief Overview of the Operation

Model VV510 Magic Finger Bagger

Ice is harvested and delivered to the Hopper at the top of the Magic Finger Bagger by other conveying equipment. When the ice fills the Hopper to a level above the lower limit switch the Bagger is ready to operate in automatic mode. During normal operation, the ice is fed down from the Hopper into a cavity in the Volumetric Drum Assembly. This cavity has an adjustment that allows the user to determine the volume of ice that will be dropped into the bag which in turn determines the weight of the ice in the bag being run. The ice is then moved over the Ice Chute Assembly by the rotating motion of the Volumetric Drum Assembly where it is guided to the pre-positioned, wicketed bag. The ice bag is opened by an inrush of air from the Blower Assembly and the ice fills it. This bagger incorporates a method of mechanically vibrating the Hopper and Volumetric Drum Assemblies with the Sure-Fall Assembly during the drop cycle to assure consistent finished bag weights. The Magic Finger Assembly (take-off) then indexes forward to mechanically move the filled ice bag onto the Conveyor Assembly. Usually while it is being moved along the Conveyor Assembly, it passes through some type of bag closing system like a wire closer (not supplied with the Magic Finger Bagger). The Conveyor Assembly then delivers the finished bag to another conveyor to be palletized or baled into multi-packs.

Installation, Maintenance, and Operation / Safety Guidelines

1. During installation or service, LOCK-OUT the power supplied to the machine to prevent accidental start-up which could cause severe injury or death.
2. NEVER operate this machine without the factory-supplied guards in place. Severe injury or death could result.
3. Do not override any of the safeguards built into and supplied with this machine. They are there to protect life and limb.
4. Do not put hands down into the Hopper Assembly or up into the Ice Chute Assembly to try to dislodge ice. After removing the ice, the bagger parts will be free to move and could cause severe injury or death.
5. NEVER operate this or any machinery while fatigued, under the influence of alcohol, controlled substances, prescription drugs, over the counter medications that may cause drowsiness, alcohol, or controlled substances.
6. Immediately discontinue use of the machine if it exhibits a distinct change in performance or makes any significantly different noises or smells.
7. Before, during, and after use, check the machine for proper alignment, breakage, and / or binding of all moving parts.
8. STAY ALERT and CAUTIOUS of moving parts. USE COMMON SENSE.
9. During normal use in un-refrigerated rooms, some melting of product will occur. The machine is not watertight and the floor below and around it will get wet. Some consideration as to the machine's placement and the flow of this water to run-offs or drains should be made prior to installation. For continued operator safety during normal operation and good housekeeping, an effort to squeegee off standing water near the machine should be made.
10. Routine safety checks and a regular maintenance schedule will assure maximum safety, machine life, and productivity.
11. Keep all power cords and the electrical source off the floor and away from standing water. Electrocution of the operator(s) could result.
12. Use only factory authorized replacement parts. This machine has been engineered using components with known characteristics and ratings. Failure to use factory authorized replacement parts can lead to a voided warranty, and / or failure in the components resulting in severe injury or death. A list of factory suggested spares to have on hand is located in the Maintenance section of this manual. Parts can be identified by the number in the circle, and the drawing number they are located on. Use the drawings supplied in this manual when calling to order replacement parts.
13. The use of petroleum based, harsh, or abrasive cleaners on the clear plastic window in the hopper will dull the surface and make it harder to see through. Clean with mild glass cleaner and a soft cloth.

General Instructions for Model VV510 Magic Finger Bagger

❖ PURPOSE

This machine has been specifically engineered to briefly store, handle, and package ice. Any other use or misuse can result in severe injury or death. Please read and understand all of the information in operation manual prior to setting up, adjusting, or operating it. Failure to follow these instructions can lead to a voided warranty, improper or dangerous function, and decreased machine life. If you have questions, need installation, factory trained service, replacement parts or additional information contact your authorized dealer or Matthiesen at 1(800) 624-8635.

❖ MANUAL

Save these instructions. They contain installation, safety, maintenance, service, factory authorized parts, and operation information. **(This manual should be left with the machine by the installer or technician.)**

Set-up Instructions for Model VV510 Magic Finger Bagger

❖ UNPACKING

Carefully remove equipment from crating.

❖ CONVEYOR MOUNTING

Loosen the setscrews on the Conveyor Assembly support arms and flip the assembly over so the motor is below the Conveyor belt and away from the Magic Finger Bagger.

❖ CONVEYOR ELECTRICAL CONNECTION

Connect the L5-15 twist-lock plug on the Conveyor motor cord to one of the receptacles on the cords from the Magic Finger Bagger pendant station. Keep excess cord away from standing water on floor.

❖ WICKETED BAG INSTALLATION

Swing the wicket rod catch, item 20 on the Top Assembly drawing #B0000 backwards and down. Place a correct sized wicket of bags (not supplied) on the wicket rods and slide them all the way forward to the stop. Place the Gravity Weight, item 13 on the rods and allow it to slide down to the bags. Swing the wicket rod catch, up and forward making sure that the wicket rods fall into the correct notches.

❖ HAMER 125 BAG CLOSER MOUNTING

Loosen the setscrews on the Hamer 125 base (not supplied) and position it over the vertical tube on the Hamer 125 mount on the Magic Finger Bagger. Retighten the setscrews. Loosen the screws, item 4 on the Hamer 125 Mounting Assembly Drawing #B0056 on the topside of the Hamer 125 mount bracket and move the Hamer 125 until its centerline is on the centerline of the Magic Finger Bagger. (Be certain to hold the Hamer 125 upright when loosening the screws so that it does not rotate.) Retighten the screws. Loosen the screws, item 5 on the underside of the Hamer 125 mount bracket and position it along the horizontal, square tube on the Magic Finger Bagger frame so that the tips of the feeder plates on the Hamer 125 are approximately 6.00" from the first bag. Position Hamer with approximately 5° tilt down this allows finger motion without interference. Retighten the screws. Connect the L5-15 twist-lock plug on the Hamer Ring Bag Closer cord to the remaining receptacle on the Magic Finger Bagger pendant station cords. Keep excess cord away from standing water on floor.

❖ INFEEED CONVEYOR ELECTRICAL CONNECTION

Connect the control circuit from feed conveyor motor (or mechanism that will deliver ice to the Magic Finger Bagger Hopper) to the top proximity switch on the Magic Finger Bagger Hopper. When the Hopper is full, it will open up the circuit and stop the flow of ice to the Hopper. When the ice in the Hopper is beyond set proximity switch sensing range, it will close again, starting the flow of ice to the Hopper.

Set-up Instructions for Model VV510 Magic Finger Bagger

❖ MAGIC FINGER BAGGER ELECTRICAL CONNECTION

Before connecting the twist-lock plug from the Magic Finger Bagger Control Enclosure cord to an electrical source, push the maintained emergency stop switch, on the Control Enclosure in to make certain the machine does not start when it is connected.

Timing and Adjusting the Model VV510 Magic Finger Bagger

❖ TIMING THE SURE-FALL MECHANISM

The Magic Finger Bagger comes from the factory with the Sure-Fall timing correctly set. These instructions are given in case of a drive chain breakage or some other unusual event that affects the timing of the machine. Remove the ice from the Hopper and run the Magic Finger Bagger until the Volumetric Drum's cavity rotates over the Ice Chute and the Sure-Fall mechanism operates. Verify that the pushing side of the cavity lines up with the beginning of the Ice Chute. If it does not line up, loosen the three screws, item 76 on the Top Assembly parts list #B-0000 that clamp the cam plate, item 46 to the modified sprocket, item 36. Rotate the cam plate until it is in the correct position to allow the Sure-Fall mechanism to operate when the pushing side of the cavity in the Volumetric Drum lines up with the beginning of the Ice Chute. Retighten the screws and recheck the timing. Additional information about switch locations, this and following steps can be found on the Adjustment / Maintenance Schedule drawing B-0009.

❖ TIMING THE MAGIC FINGER MECHANISM

The Magic Finger Bagger only comes from the factory with the correct Magic Finger mechanism settings if a wicket of the customer's bags had been sent to the factory for testing prior to shipping. These instructions are given in case of bag size changes or start-up from scratch. If you are uncertain about the timing of the Magic Finger mechanism (the J-shaped hook on the front of the machine) it is best to loosen the setscrews, item 13 on Magic Finger Assembly drawing #B0043. These hold the drive lever, item 2 to the main shaft, item 8. With a wicket of bags installed, run the Magic Finger Bagger until the all-threaded connecting rod, item 11 extends forward, out of the main guard the farthest. Stop the Magic Finger Bagger. When the drive lever is pushed to the maximum forward position the Magic Finger wand will be at the maximum rearward position. To set the correct item 1, Magic Finger wand position, move the wand rearward until it is at a location ½" from the position that the ice chute door will be when it opens fully. Retighten the setscrews in the drive lever. Run the Magic Finger Bagger with the Blower Fan on until the first bag on the wicket is opened up. Check that the fingers at the bottom of the wand are pointing forward and that they contact about 1 ½" down from the forward most, inside lip of the opened bag. To adjust, loosen the setscrews, item 13 in the wand attachment block, item 10 and set the height of the wand to the correct position. Retighten the setscrews. Note: The wand should be ½" above the tops of the feeder plates on the Hamer 125 ring closer.

❖ ADJUSTING THE STROKE ON THE MAGIC FINGER MECHANISM

If the stroke (length of travel) that the Magic Finger wand moves is too long or short it can be adjusted by loosening the setscrews, item 13 on Magic Finger Assembly drawing #B0043 that hold the drive shaft attachment block, item 7 to the drive lever, item 2. If it is moved upward (away from the main shaft, item 8) it will shorten the stroke. If the drive shaft attachment block is moved downward (towards the main shaft, item 8) it will lengthen the stroke. Retighten the setscrews and recheck the stroke. Note: The wand should move forward and take the ice bag to a position about 1 ½" passed the tips of the tips of the feeder plates on the Hamer 125 bag closer.

❖ ADJUSTING THE HEIGHT OF THE ICE BAG SHELF

Run the Magic Finger Bagger with the Blower Fan on until the first bag on the wicket is opened completely. The bottom of the bag should be on the top of the Bag Shelf Assembly. To adjust, loosen the two screws, item 5 on Bag Shelf Assembly drawing #B-0040-C, move to the desired height (while keeping it level) and retighten screws.

Timing and Adjusting the Model VV510 Magic Finger Bagger

❖ ADJUSTING THE BAG RETAINER RODS ON THE BAG SHELF ASSEMBLY

The bag retainer rods can be adjusted for different width ice bags. To adjust the bag retainer rods, item 2 on Bag Shelf Assembly drawing #0062-B, loosen the setscrews in the collar and move them to the desired position and retighten the setscrews. The bag retainer rods should be the same distance from the Magic Finger Bagger and bag centerlines. When the bag is filled with ice, it starts to tear from the wicket rods. When the Magic Finger take-off mechanism pulls the bag from the Bag Shelf Assembly forward to the Conveyor Assembly it completes the separation. The bag retainer rods keep the wicketed bags that are not being filled from being drawn forward and getting caught or pulled off too soon.

❖ ADJUSTING THE AMOUNT OF AIR FLOWING TO OPEN THE ICE BAG

If the amount of air flowing to open the ice bag is too small, the ice bag will not open up all the way which could result in a partially filled or an unfilled bag. It may also prevent the Magic Finger wand from getting into the inside of the bag resulting in the bag not getting taken off the Bag Shelf. If it is too large, it could blow the bag completely off of the wicket before the ice is even dropped. To adjust the airflow, loosen the wingnut, item 10 on the Blower Assembly drawing #B0042 and rotate the shroud damper, item 4 to cover either more of the opening for a smaller airflow, or cover less of the opening, for a larger airflow. Retighten wingnut. The metering door, item 4 on the Ice / Air Chute Assembly drawing #B0047 should close to about a ½" gap. To adjust the amount of gap, loosen the screws, item 11 and move the stop, item 5 to the desired location. This setting also affects the air-flow into the bag.

❖ ADJUSTING THE CONVEYOR BELT HEIGHT

The Conveyor belt height and angle can be adjusted by loosening the setscrews, item 41 on the Conveyor Assembly drawing #B0050 that connect the Conveyor to the support arms on the frame and repositioning it. The top of the Conveyor belt end near the Magic Finger Bagger should be just below the bottom of the Bag Shelf Assembly. The top of the other end of the Conveyor belt should be positioned to allow a smooth transition (hand-off) to any ancillary take-off equipment being used.

Start-up Instructions for Magic Finger Bagger

❖ RUNNING MACHINE AND CHECKING THE ICE BAG WEIGHT

After completing all of the set-up procedures outlined in this operation manual, double check that the correct bags are installed on the wicket rods and that the Gravity Weight is in place. Fill the Hopper with the same type of ice that you will be running. Turn the MANUAL / AUTOMATIC switch, item 8 on the Magic Finger Bagger Adjustment / Maintenance drawing #B0000 sheet 9 of 14 to the “MAN” position. Press the start button, item 9 one time. The Magic Finger Bagger should go through one complete cycle and then stop. Verify that all of the adjustments are correct, that the ring from the closer is positioned where it is desired, and that all of the ice is out of the Ice Chute Assembly. Weigh the bag of ice to verify that the Volumetric Drum Assembly setting is correct.

❖ CHANGING THE ICE BAG WEIGHT

To change the weight of the bag loosen the three screws, item 5 on the Volumetric Drum Assembly drawing #B0045 and rotate the outer drum, item 2 in the direction desired per the increase / decrease label, item 4. Repeat the previous step and fill another bag. If all of the adjustments appear to be correct, move the MANUAL / AUTOMATIC switch to the “AUTO” position. Make certain that the Hopper is full of ice. Press the start button one time and allow the Magic Finger Bagger to run a dozen bags or so. Verify that the bag weights are consistent and that the infeed conveyor motor is cycling on and off properly when the Hopper proximity switches open and close.

Troubleshooting the Model VV510 Magic Finger Bagger

If the Magic Finger Bagger does not operate properly after completing the start-up adjustments and timing procedures please check the following before consulting the factory:

1. The circuit breaker at the power source that supplies the Bagger is in the “ON” position.
2. The power cord on the Control Enclosure is plugged into the proper receptacle and that power is making it to the terminal blocks, on the back panel assembly where the cord wires are connected.
3. The circuit breakers are in the “ON” position.
4. The main power fuse in panel is not blown and is installed properly in the fuse holder.
5. The two fuses on back panel assembly are not blown and are installed properly in the holders. Check motor speed control heat sink.
6. After checking the items on the back panel assembly in the Control Enclosure, close the cover and check that the main power lock-out switch on the enclosure cover is in the “ON” position.
7. The power cords are properly connected from the Conveyor Assembly and Closure unit (heat or wire) to the two twist-lock receptacles on the Magic Finger Bagger pendant station.
8. The automatic / manual switch on the Control Enclosure is in the “MAN” position if one single cycle per push of the “START” button is desired and in the “AUTO” position for continuous operation. Note: If the ice in the Hopper is not above the level of the lower sensor, it will not allow machine operation in the “AUTO” mode.
9. All of the mechanical adjustments are correct and that all screws and setscrews are tight.
10. On FSV (Feed Screw Volumetric) if auger does not run check lower chain and sprockets of auger. If align is set correctly check top hopper sensor adjustment, reset overloads, fuses and motor.
11. If after going through the troubleshooting procedures and your Magic Finger Bagger is still not operating properly, contact your authorized dealer.

Maintaining the Model VV510 Magic Finger Bagger

- ❖ The effort required to maintain the Magic Finger Bagger is far less than the trouble caused by frequent breakdowns, premature part wear resulting in early replacement, and process down time.
- ❖ Refer to the Magic Finger Bagger Lubrication / Maintenance Schedule drawing #B0000, sheet 8 for the bearing, bushing, and required lubrication or maintenance locations listed below.
- ❖ Reducers, bearings and chain are lubricated at the factory. Because of use in wet conditions they should be inspected and lubricated accordingly.
- ❖ Matthiesen recommends the use of food grade lubricants on all necessary parts.
- ❖ Reducers and gear motors: Food grade oil
- ❖ Flange bearings: Food grade grease

Note: A small amount of grease at frequent intervals is preferable to large amounts at infrequent intervals.

Matthiesen stocks the following food grade Lubriplate® products:

Matthiesen Stock#

PT560 – FMO 900 AW gear oil

RS035 – FGL-1 grease cartridge

RS036 – FMO 350 spray

Every 500 hours of operation:

1. Grease the top and bottom 1 ½” upper and lower main bearings call-out 2 and 3.

Quarterly:

1. Lubricate the end of the blower motor shaft bearings; call-out 5 with light machine oil.

Monthly:

1. Grease the upper and lower 1” pillow block bearings on the Sure-Fall Assembly call-out 1.
2. Lubricate the end of the main motor shaft bearings; call-out 4.
3. Lubricate the end of the Conveyor motor shaft bearings; call-out 6.
4. Grease the four ¾” flanged bracket bearings on the Conveyor Assembly call-out 7.
5. Lubricate the two Magic Finger Assembly shaft bushings; call-out 8.
6. Lubricate the two Ice Chute door shaft bushings; call-out 9.
7. Lubricate the three cam follower bearings; call-out 10.
8. Grease the four, caster bearings call-out 11 and lubricate the axles with light machine oil.
9. Lubricate the flywheel shaft and bushing; call-out 13.
10. Lubricate the two flywheel drive shaft ball joints; call-out 14.
11. Lubricate the three roller chains on the Magic Finger, call-out 15.
12. Remove and clean the air intake filter. Replace if filter material is damaged or can not be cleaned without the use of soap or solvents. Note position of input baffle before removing.
13. Check for loose hardware, belts, chains, or wiring. Tighten as required.



OPERATING INSTRUCTIONS & PARTS MANUAL

HIGH PRESSURE DIRECT-DRIVE BLOWERS

MODELS 2C940, 2C820, 4C108, 4C329 AND 4C330

FORM 5S2052

06820

0390/073/5M

READ CAREFULLY BEFORE ATTEMPTING TO ASSEMBLE, INSTALL, OPERATE OR MAINTAIN THE PRODUCT DESCRIBED. PROTECT YOURSELF AND OTHERS BY OBSERVING ALL SAFETY INFORMATION. FAILURE TO COMPLY WITH INSTRUCTIONS COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE! RETAIN INSTRUCTIONS FOR FUTURE REFERENCE.

Description

Dayton direct-drive high pressure blowers are used for small exhaust systems where air is laden with dust or where dust-collection bags are necessary. Applications include handling long stringy material, paper trim, fibrous material such as textile scrap, wool and ensilage. Not suitable for coarse material. Heavy or abrasive dust. Dynamically balanced self-cleaning cast aluminum wheels. 16 GA housing and motor base. Maximum operating temperature 180°F (82°C). Finished in baked-on gray enamel. Blower can be assembled for CW or CCW rotation and any one of eight standard discharge positions. See Figure 2. Dayton motors packed separately when blowers are ordered complete.

General Safety Information

1. Follow all local electrical and safety codes, as well as the National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA).
2. Blower must be securely and adequately grounded. This can be accomplished by wiring with a grounded, metal-clad raceway system by using a separate ground wire connected to the bare metal of blower frame, or other suitable means.
3. Always disconnect power source before working on or near a motor or its connected load. If the power disconnect point is out-of-sight, lock it in the open position and tag to prevent unexpected application of power.
4. Be careful when touching the exterior of an operating motor — it may be hot enough to be painful or cause injury. With modern motors this condition is normal when operated at rated load and voltage — modern motors are built to operate at higher temperatures.
5. Protect the power cable from coming in contact with sharp objects.
6. Do not kink power cable and never allow the cable to come in contact with oil, grease, hot surfaces, or chemicals.
7. Make certain that the power source conforms to the requirements of your equipment.
8. When cleaning electrical or electronic equipment, always use an approved cleaning agent such as dry cleaning solvent.
9. Not recommended as an explosion proof blower. Do not use where explosive fumes or gases are present.
10. If blower is operated without an inlet or outlet duct, guard openings in accordance with OSHA regulations to prevent contact with rotating blower wheel.

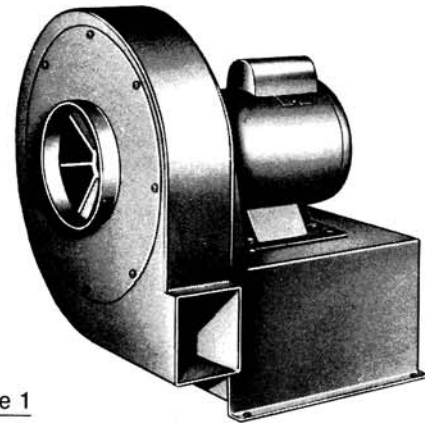


Figure 1

⚠ WARNING ⚠

KEEP HANDS AWAY FROM INLET WHILE BLOWER IS IN OPERATION.

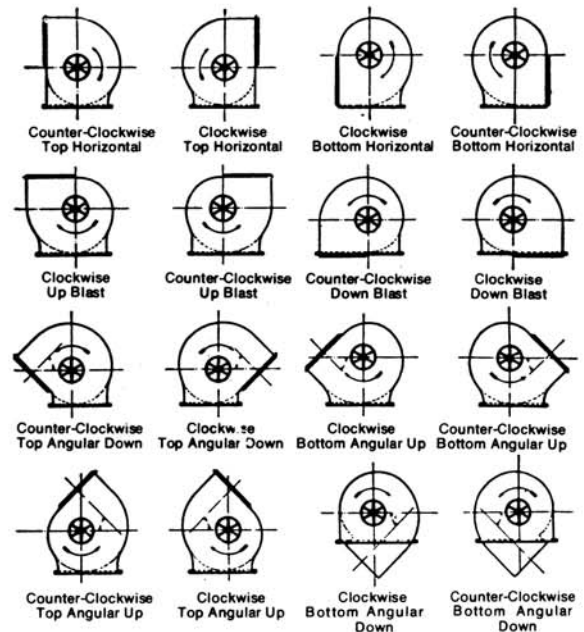


Figure 2

Specifications

MODEL	WHEEL			HIGH-PRESSURE BLOWER DIMENSIONS																X ADJ. MIN.	X ADJ. MAX.
	DIA.	W	BORE	A	B	C	D	E	F	G	H	J	K	L	O	P	R	S	V		
2C940	7 ³ / ₄ "	2 ⁵ / ₁₆ "	1/2"	11"	8"	3"	3"	5"	7"	1/2"	5 ³ / ₈ "	4 ⁷ / ₈ "	5 ⁷ / ₈ "	5 ⁷ / ₈ "	12 ¹ / ₄ "	4"	6 ⁵ / ₈ "	5 ¹ / ₂ "	—	8 ¹ / ₄ "	9 ³ / ₄ "
2C820	9	2 ¹³ / ₁₆ "	1/2"	12 ¹ / ₈ "	8	3 ¹ / ₂ "	3 ¹ / ₂ "	5 ⁵ / ₈ "	7	1/2"	6 ³ / ₈ "	5 ³ / ₄ "	6 ⁷ / ₈ "	6 ³ / ₄ "	12 ³ / ₄ "	5	7 ¹ / ₂ "	6 ³ / ₈ "	—	9 ¹ / ₈ "	10 ⁵ / ₈ "
4C108	10 ⁹ / ₁₆ "	3	5/8"	14 ³ / ₄ "	9	4	3 ¹ / ₂ "	6 ⁷ / ₈ "	7 ¹ / ₂ "	3/4"	7 ¹ / ₄ "	6 ¹ / ₂ "	8	7 ⁵ / ₈ "	14	6	8 ⁵ / ₈ "	8 ¹ / ₄ "	—	11 ³ / ₈ "	12 ⁷ / ₈ "
4C329	12 ¹ / ₂ "	3	7/8"	17	11 ¹ / ₂ "	5	4	8	9 ³ / ₄ "	3/4"	8 ¹ / ₄ "	7 ¹ / ₂ "	9	9 ⁵ / ₈ "	17	7	10	7 ¹ / ₈ "	—	10 ⁵ / ₈ "	10 ⁵ / ₈ "
4C330	13 ¹ / ₂ "	4 ³ / ₈ "	1 ¹ / ₈ "	17 ¹ / ₂ "	11 ¹ / ₄ "	7 ¹ / ₈ "	5 ³ / ₄ "	8	9 ¹ / ₂ "	1	10 ¹ / ₂ "	9 ⁵ / ₈ "	11 ³ / ₈ "	11	18 ⁷ / ₈ "	8	11 ¹ / ₂ "	8 ¹ / ₈ "	7 ¹ / ₄ "	12 ⁵ / ₈ "	12 ⁵ / ₈ "

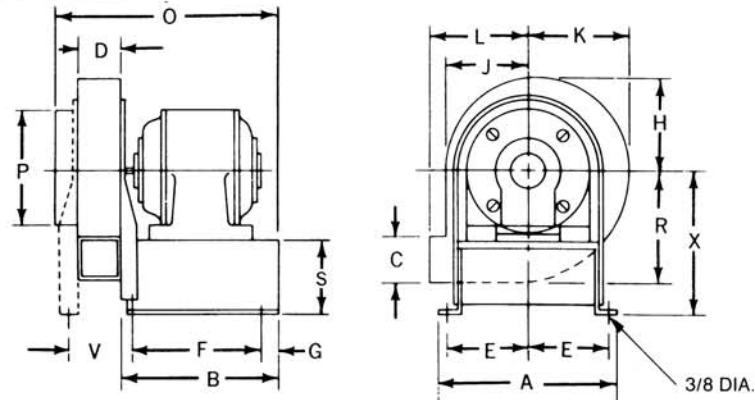


Figure 3

Performance

MODEL	HP REQ'D.	MOTOR FRAME	VOLTS	MOTOR TYPE	CFM AIR DELIVERY AT 3450 RPM								SHPG. WT.
					1" SP	2" SP	3" SP	4" SP	5" SP	6" SP	7" SP	8" SP	
2C940	1/3	48	115	Split	290	230	160	—	—	—	—	—	13
2C820	1/3	48	115	Split	530	470	415	335	165	—	—	—	17
4C108	1	56	115/230	Cap. (†)	800	745	680	610	510	375	225	—	25
4C329	3	145T	230/460	3-Ph.	1200	1140	1070	1010	940	870	790	695	37
4C330	5	182T	230/460	3-Ph.	2140	2030	1930	1820	1710	1615	1500	1375	64

(†) Also available in 208-230/460, 60Hz, 3-Phase.

Based on standard test codes of (AMCA) Air Moving and Conditioning Association

⚠ CAUTION

Must not be used where static pressure is less than shown in table. Severe motor overload will result. Motor overload protection, closely matched to motor full-load current, is highly recommended.

LIMITED WARRANTY

DAYTON ONE-YEAR LIMITED WARRANTY High pressure direct drive blowers, Models 2C940, 2C820, 4C108, 4C329, & 4C330, are warranted by Dayton Electric Mfg. Co. (Dayton) to the original user against defects in workmanship or materials under normal use for one year after date of purchase. Any part which is determined by Dayton to be defective in material or workmanship and returned to an authorized service location, as Dayton designates, shipping costs prepaid, will be, as the exclusive remedy, repaired or replaced at Dayton's option. For limited warranty claim procedures, see PROMPT DISPOSITION below. This limited warranty gives purchasers specified legal rights which vary from state to state.

LIMITATION OF LIABILITY. To the extent allowable under applicable law, Dayton's liability for consequential and incidental damages is expressly disclaimed. Dayton's liability in all events is limited to, and shall not exceed, the purchase price paid.

WARRANTY DISCLAIMER. Dayton has made a diligent effort to illustrate and describe the products in this literature accurately; however, such illustrations and descriptions are for the sole purpose of identification, and do not express or imply a warranty that the products are merchantable, or fit for a particular purpose, or that the products will necessarily conform to the illustrations or descriptions.

Except as provided below, no warranty or affirmation of fact, expressed or implied, other than as stated in "LIMITED WARRANTY" above is made or authorized by Dayton.

PRODUCT SUITABILITY. Many states and localities have codes and regulations governing sales, construction, installation, and/or use of products for certain purposes, which may vary from those in neighboring areas. While Dayton attempts to assure that its products comply with such codes, it cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Before purchase and use of a product, please review the product application, and national and local codes and regulations, and be sure that the product, installation, and use will comply with them.

Certain aspects of disclaimers are not applicable to consumer products; e.g., (a) some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you; (b) also, some states do not allow limitations on how long an implied warranty lasts, consequently the above limitation may not apply to you; and (c) by law, during the period of the Limited Warranty, any implied warranties of merchantability or fitness for a particular purpose applicable to consumer products purchased by consumers, may not be excluded or otherwise disclaimed.

PROMPT DISPOSITION. Dayton will make a good faith effort for prompt correction or other adjustment with respect to any product which proves to be defective within limited warranty. For any product believed to be defective within limited warranty, first write or call dealer from whom product was purchased. Dealer will give additional directions. If unable to resolve satisfactorily, write to Dayton at address below, giving dealer's name, address, date and number of dealer's invoice, and describing the nature of the defect. Title and risk of loss pass to buyer on delivery to common carrier. If product was damaged in transit to you, file claim with carrier.

Manufactured for Dayton Electric Mfg. Co., 5959 W. Howard St., Chicago, IL 60648

Assembly

1. Attach base upright to the motor mounting base as shown in the exploded view. Hand tighten (4) 1/4-20 x 1/2" bolts, washers, and nuts through slotted holes in base upright. Place motor on motor base and align the center hole of the base upright with the motor shaft. Secure the four 1/4-20 bolts. Models 4C329 and 4C330 have a welded motor base assembly.
2. Bolt the housing to the base upright in the desired discharge position using #10 x 3/8 or 5/16-18 x 3/4" self tapping bolts. Blower is clockwise rotation. Refer to exploded view showing clockwise bottom horizontal discharge.
3. With the motor shaft through the center hole of the base upright, align the mounting holes of the motor to the pre-drilled holes in the motor base. Install two bolts to retain proper motor alignment but do not tighten. Mount the wheel to the motor shaft. Refer to exploded view drawing.
4. Mount the inlet ring to the housing and secure with #10 x 3/8" or 5/16-18 x 3/4" self tapping bolts.
5. Slide the wheel toward the inlet ring so there is at least 1/4" clearance between the wheel and cone. The motor shaft should extend through the hub of the wheel so when the setscrews are securely tightened, they will make contact with the motor shafts.
6. Install the remaining nuts, bolts, and washers (not provided) to the motor mounting holes of the motor and secure to the blower motor base.

Installation

1. Make sure all bolts and screws are tightened before mounting on a rigid, flat, level foundation. Bolt the blower securely into position.
2. Check the interior of the fan housing to be sure it is free of debris. Rotate the wheel to insure that it is not rubbing or binding. Check the clearance of the

wheel and the inlet ring. If rubbing exists, loosen the bolts on the ring and shift the ring until clearance is obtained. If still rubbing, loosen the set screw on the wheel and shift the wheel rearward to obtain clearance. Retighten the set screw.

Operation

1. Before connecting the motor to the electric supply, check the electrical characteristics as indicated on the motor nameplate to insure proper voltage and phase.

CAUTION

A ground wire must run from the blower motor housing to a suitable electrical ground such as a properly grounded metallic raceway or a ground wire system.

2. After electrical connections are completed, apply just enough power to start the unit. Be sure that the rotation of the wheel is correct as indicated by directional arrows on the unit. If proper rotation, apply full electrical power.
3. With the air system in full operation and all ducts attached, measure current input to the motor and compare with the nameplate rating to determine if the motor is operating under safe load conditions.

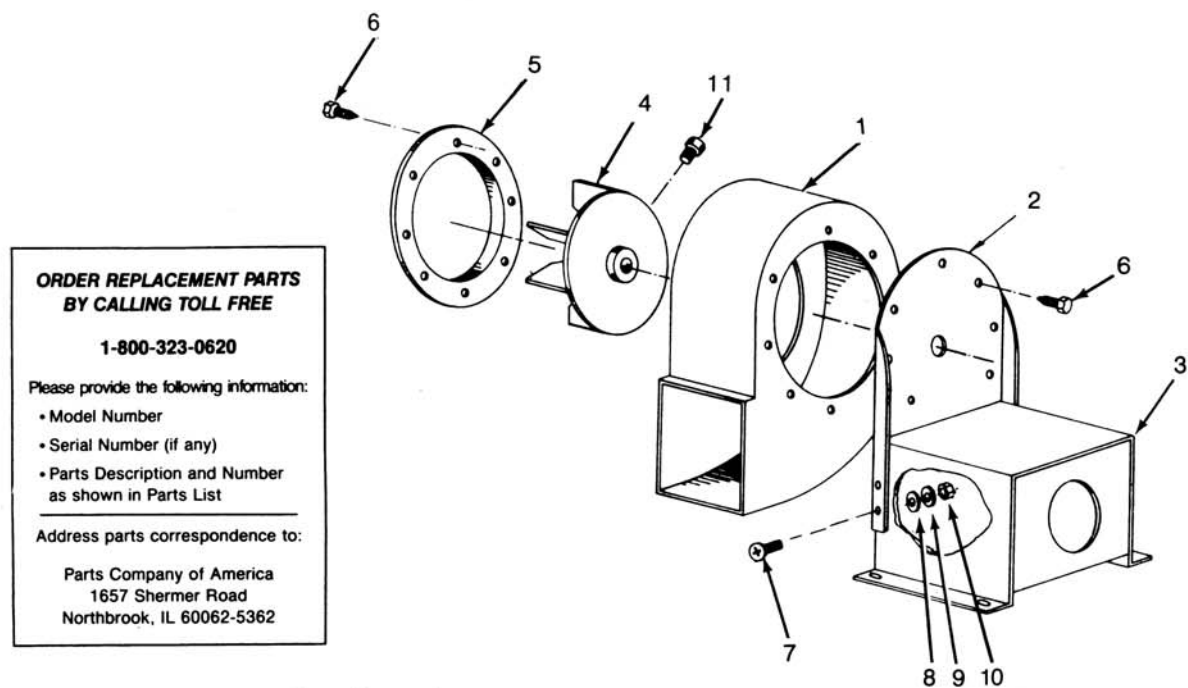
Maintenance**CAUTION**

Before attempting any repair work, be certain that all power to the motor and electrical accessories are turned off and locked in the off position.

- A. Periodically remove dirt from blower wheel and housing.
- B. Check tightness of wheel setscrews.
- C. After disconnecting the power source, check the wiring to see if insulation is damaged or frayed.
- D. Relubricate motor per manufacturer's instructions. Remove any excess lubricants.

Troubleshooting Chart

SYMPTOM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Noise.	1. Foreign objects in housing. 2. Loose setscrew on wheel. 3. Incorrect wheel rotation.	1. Remove. 2. Tighten. 3. Reverse rotation.
Motor bearing noise.	Lack of bearing lubrication.	Lubricate.
Excessive vibration.	1. Loose wheel on shaft. 2. Loose mounting bolts. 3. Motor out of balance. 4. Wheel out of balance. 5. Accumulation of material on wheel.	1. Tighten setscrews. 2. Tighten. 3. Replace. 4. Replace or rebalance. 5. Clean.
Motor overloaded.	System static pressure less than 1" water column.	Increase system static pressure.



**ORDER REPLACEMENT PARTS
BY CALLING TOLL FREE**

1-800-323-0620

Please provide the following information:

- Model Number
- Serial Number (if any)
- Parts Description and Number as shown in Parts List

Address parts correspondence to:

Parts Company of America
1657 Shermer Road
Northbrook, IL 60062-5362

Figure 4 — Replacement Parts Illustration

Replacement Parts List

REF. NO.	DESCRIPTION	PART NO. FOR MODEL:				
		2C940	2C820	4C108	4C329	4C330 (‡)
1	Housing scroll	201-08-4005-5	201-09-4003-5	201-11-4005-5	201-12-4004-5	201-14-4005-5
2	Base upright	618-08-7001-5	618-09-7001-5	618-11-7002-5	—	—
3	Motor base assembly	203-08-7001-5	203-09-7001-5	203-11-7005-5	203-12-4016-5	203-14-4011-5
4	Wheel	602-08-4001-5	602-09-4001-5	602-11-4002-5	602-12-4004-5	602-14-4003-5
5	Inlet ring	609-08-4002-5	609-09-4001-5	609-11-4003-5	602-12-4003-5	609-14-4001-5
6	Hex hd. screw	#10 x 3/8" 8 Req'd.	#10 x 3/8" 14 Req'd.	#10 x 3/8" 14 Req'd.	5/16-18 x 3/4" 16 Req'd.	5/16-18 x 3/4" 16 Req'd.
7	Slotted machine screw*	1/4-20 x 1/2" 4 Req'd.	1/4-20 x 1/2" 4 Req'd.	1/4-20 x 1/2" 4 Req'd.	—	—
8	Flat washer*	1/4 4 Req'd.	1/4 4 Req'd.	1/4 4 Req'd.	—	—
9	Split washer*	1/4 4 Req'd.	1/4 4 Req'd.	1/4 4 Req'd.	5/16 16 Req'd.	5/16 16 Req'd.
10	Hex nut*	1/4"-20 4 Req'd.	1/4"-20 4 Req'd.	1/4"-20 4 Req'd.	—	—
11	Setscrew	†	†	†	†	†

NOTE — Models 4C329 and 4C330 have welded 1 piece motor base & upright assembly.

(‡) Model 4C330 has inlet upright supports (not shown) to support housing. Order by P/N 617-13-7002-5.

(*) Standard hardware item, available locally.

(†) Available with wheel.

Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

Dayton® Speed Reducers

Description

Dayton right-angle speed reducers are designed for continuous duty, high torque, slow speed applications such as packaging, food processing, etc. Units are equipped with hardened worm and bronze worm gear, Timken roller bearings on output shaft, double lip seals and cast aluminum housing.

NOTE: Speed reducers are built for direct coupling or V-belt drive with up to a 1 HP, 1725 RPM motor. Lower input speed may be used with a proportional decrease in input HP and output speed. Lower input HP may be used with a proportional reduction output torque. (Consult Specifications)

A	C	D	D ¹	E	F	H	N	N ¹
5 ³ / ₄	7 ¹ / ₁₆	2 ¹ / ₂	4 ¹ / ₂	2 ³ / ₈	4 ³ / ₄	1 ¹ / ₃₂	1 ¹³ / ₃₂	2
O	U	U ¹	V	V ¹	AB	XL		
5 ¹³ / ₁₆	0.7500/0.7495	0.6250/0.6245	1 ⁵ / ₈	1 ⁷ / ₁₆	2 ⁷ / ₁₆	8		

NOTE: All dimensions given in inches.

Dimensions

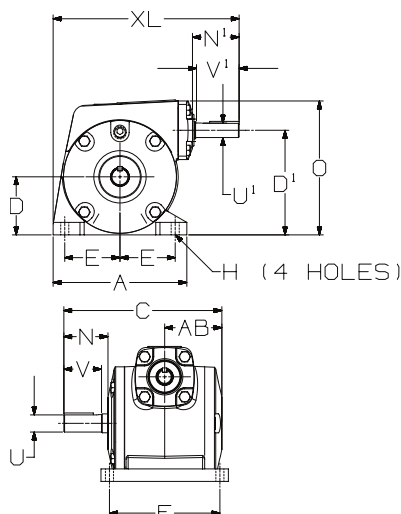


Figure 2

General Safety Information

The safety information following refers to the complete installation as well as the reducer.

⚠ WARNING **Disconnect power before installing or servicing.**

1. Follow all local electrical and safety codes, the United States National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA).

2. Motor (not included with this unit) must be securely and adequately grounded. This can be accomplished by wiring with a grounded, metal-clad raceway system, by using a separate ground wire connected to the bare metal of the motor frame, or other suitable means. Refer to NEC Article 250 Grounding for additional information
3. Always disconnect power source before working on or near a motor or its connected load. If the power disconnect point is out of sight, lock it in the open position and tag it to prevent unexpected application of power.
4. All moving parts should be guarded.
5. Be careful when touching the exterior of an operating motor; it may be hot enough to be painful or cause injury. Modern-design motors run hot when operated at rated load and voltage.
6. Prevent the power cable from touching sharp objects, oil, grease, hot surfaces, or chemicals
7. Do not kink the power cable.
8. Make certain that the power source conforms to the requirements of

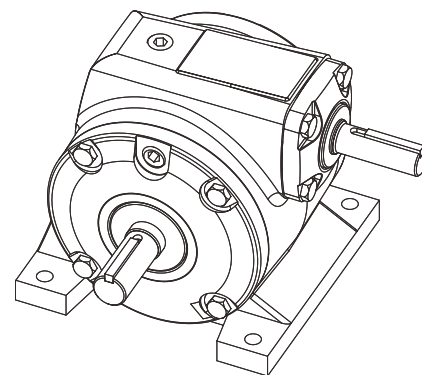


Figure 1

- your equipment.
9. Keep cleaning rags and other flammable waste materials in a tightly closed metal container and dispose of in the proper fashion.
10. Clean electrical or electronic equipment with approved cleaning agent such as dry cleaning solvent.
11. Be sure the output shaft key is fully captive or is removed before running the reducer.

⚠ CAUTION **Do not install an automatic reset motor starting device in applications where unexpected starting could harm personnel or equipment.**

Dayton® Speed Reducers

Specifications and Performance

Model	Ratio	1725 RPM Input			1160 RPM Input			875 RPM Input		
		Output RPM	Output Torque In-Lb	Max. Input HP	Output RPM	Output Torque In-Lb	Max. Input HP	Output RPM	Output Torque In-Lb	Max. Input HP
2Z306F	58:1	30	285	1/3	20	416	1/3	15	495	1/3
2Z307F	39:1	45	337	1/2	30	530	1/2	22	451	1/3
2Z308F	26:1	67	385	3/4	45	392	1/2	34	498	1/2
2Z309F	18:1	96	360	1	64	409	3/4	49	342	1/2
2Z310F	11:1	157	302	1	105	403	1	79	385	3/4

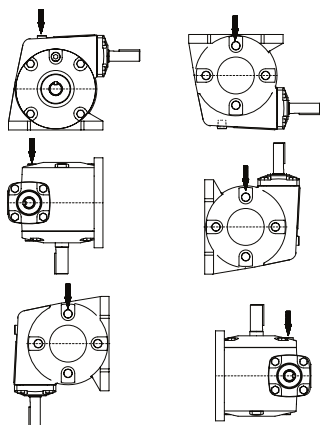


Figure 3

Figure 3 - Proper Vent Plug Location and Oil Level

NOTE: Arrow indicates vent plug location, Dotted line indicates proper oil level. Use any plug along this line to check oil level. (On near or far side).

Installation

Do not install the reducer, motor or base assembly in an explosive atmosphere unless the motor and the complete installation are qualified and approved for such use.

When an installation involves a holding or overhauling application (such as a hoist or conveyor), a separate magnetic brake or other locking device should be used. Do not depend on gear friction to hold the load.

⚠ CAUTION

Check the oil level (see Lubrication section). Depending on mounting position used, too little or too much lubrication will diminish life or reducer.

1. Locate the speed reducer in a clean and dry area with access to adequate motor cooling air supply. If installation is outdoors, make certain that the unit is protected from the weather.
2. Mount the motor on mounting base (steel preferred), using proper height spacers (1" thick for 56 frame motor; 1½" thick for 48 frame motor) to align motor shaft with gear reducer input shaft. Fasten motor to mounting surface, using suitable bolts. Installing coupling on motor shaft and securely tighten setscrew

NOTE: Speed reducer may be used with any NEMA 56 (preferred) or 48 frame, rigid base motor, up to 1 HP at 1725 RPM, depending upon which gear ratio is used.

3. Install coupling body on speed reducer shaft (if spider cushion-type coupling is being used). Place reducer on mounting surface, aligning motor and reducer couplings. Install spider cushions between coupling bodies. Assemble reducer to mounting surface, using four 5/16" diameter bolts. Do not tighten at this time. Align input shaft of reducer with

motor shaft as best possible, shimming if necessary. Minor shaft misalignment will be compensated for by the coupling. Excessive misalignment will cause undue coupling wear, and possible bearing damage. Tighten speed reducer mounting bolts.

4. Remove solid pipe plug from uppermost location on housing, and replace it with the vent plug provided. Failure to do so may cause lubricant leakage past the shaft seals. See Figure 3 for proper vent location, depending on orientation of the reducer.
5. Before connecting load, turn coupling by hand to assure no binding or excessive misalignment has occurred.

6. Attaching (coupling) the load:

NOTE: To determine output torque capacity for operating conditions other than normal 8-hour days with shock-free operation, multiply the rated output torque for the speed reducer (from Specifications and Performance) by the applicable load factor listed in the Load Factor Chart. Avoid shock loads.

Models 2Z306F thru 2Z310F

Installation (Continued) Load Factors

Type of Service	Loading		
	Uniform	Moderate Shock	Heavy Shock
Applications with few (up to 10) stops and starts per day			
Occasional (1/2 hr. total/day)	1.25	1.10	1.00
Intermittent (2 hrs. total/day)	1.10	1.00	0.80
8 hrs./day	1.00	0.80	0.67
24 hrs./day	0.80	0.67	.057
Applications with frequent (over 10) stops and starts per day			
Occasional (1/2 hr. total/day)	1.10	1.00	0.80
Intermittent (2 hrs. total/day)	1.00	0.80	0.67
8 hrs./day	0.80	0.67	0.57
24 hrs./day	0.67	0.57	.050

a. Overhung Loads:

Sideward (radial) force on a motor output shaft is called overhung load. Driving a load through a gear, sprocket wheel, or belt pulley which is mounted on the speed reducer output shaft causes overhung load on the shaft. Too much overhung load can break the shaft or cause the bearings to fail prematurely.

Calculate the amount of overhung load which the speed reducer will receive in your installation as follows:

$$\text{Overhung Load (Lbs)} = \frac{(2) \times (T) \times (C) \times (L)}{D}$$

The terms of the above formula are as follows:

- (T) = Full Load Torque of speed reducer, in in.-lbs., from Specifications and Performance
- (C) = Coupling Factor from following chart, accounting for type of coupling
- (D) = Pitch Diameter, in inches, of coupling being mounted on gear motor's output shaft

(L) = "Leverage" Factor from following chart, accounting for position of coupling along length of speed reducers output shaft

Coupling Factors

Coupling Type	Factor
Chain Sprocket Wheel	1.00
Gear (pinion)	1.25
V-Belt Pulley	1.50
Flat Belt Pulley	2.50

"Leverage" Factors

Coupling Type	Factor
End of shaft extension	0.80
Center of shaft extension	1.00
Next to shaft extension shoulder	1.20

After calculating the amount of overhung load expected in your installation, compare it to the overhung load rating.

CAUTION Maximum allowable

overhung load is 600 lbs.

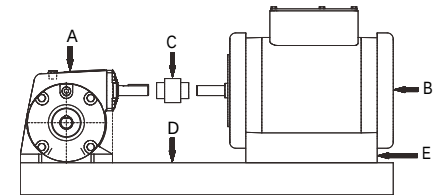
If the expected amount of overhung load is higher than the specified limit, you must change a component or the location of a component in your installation to bring the overhung load within the limit. To increase the operating life of the speed reducer bearings, design your installation to reduce overhung load as much as possible.

CAUTION Excessive static tension (i.e. tension present when not running) will cause additional, unnecessary, overhung load; set tension no higher than recommended by chain or belt manufacturer.

- b. On direct-coupled installations, carefully check shaft and coupling alignment while bolting down speed reducer. Shim as required. Do not depend on a flexible coupling to compensate for misalignment.

7. Make final wiring connections (consult nameplate on motor).

NOTE: Output shaft may be run in either direction by changing motor connections. Per diagram or instructions by motor manufacturer.



A-Reducer, B-Motor, C-Coupling, D-Mounting Base, E-Spacers

Figure 4 - Typical Installation Maintenance

WARNING Make certain that the power supply is disconnected before attempting to service or remove any components! If the power disconnect point is out-of-sight, lock it in the open position and tag to prevent unexpected application of power to installation.

- If internal parts have been replaced on the output shaft assembly, new adjustment for end play will be required.
 - Reassemble unit, beginning with the same shim stack thickness behind the bearing cup in the housing cover as before. Oil seal (Ref. Figure 5 No. 20) should be removed from cover until shimming process is completed and rotation checked to avoid damage to seal from possible repetitious disassemblies of cover.
 - Install new gasket (Ref. Figure 5 No. 18) if required.
 - As the capscrews (Ref. Figure 5 No. 21) holding the housing cover (Ref. Figure 5 No. 19) are being tightened, pull shaft back and

Dayton® Speed Reducers

Installation (Continued)

- forth to verify end play exists. If detectable end play completely disappears before capscrews are completely tight (torqued to 10 ft. lbs.), disassemble and remove sufficient shims until, with capscrews fully tightened, shaft end play is barely detectable (0.001 to 0.004).
- 2. When sliding a shaft seal over a shaft extension, all sharp edges (keyways, etc.) must be protected with tape to prevent lips of oil seal from being damaged.
 - 3. When replacing seals, they must be pressed squarely into the bore, to prevent distortion and damage.
 - a. Press on metal retainer only. Lips should be towards the inside of unit.
 - b. The oil seal in the bearing cap assembly (Ref. Figure 5 No. 9) is preassembled in the cap. Use bearing grease to coat seal surface on shaft for initial run and pack same grease between lips on seal and on side of seal towards inside of unit.
 - 4. If unit has been disassembled, new gaskets may be required to prevent lubricant leakage. Both bearing cap and housing cover are assembled with a gasket. Gaskets should have shellac on one side only, due to possible repeated disassemblies to achieve the proper output shaft end play.
 - 5. If unit has been disassembled and no parts including the gasket (Ref. Figure 5 No. 18) have been replaced, no change in the shim stack (Ref. Figure 5 No. 17) should be required unless due to wear on parts. (Check end play before disassembly).
 - 6. When replacing bearings, care should be exercised that new bearings are pressed on straight and properly seated against the shaft

shoulder or bore recess. For bearings on shafts, press on inner race only.

Cleaning

Properly selected and installed electric motors are capable of operating for long periods with minimal maintenance. Periodically clean dirt accumulations from open-type motors, especially in and around vent openings, preferably by vacuuming (avoids imbedding dirt in windings). At the same time, check that electrical connections are tight.

Lubrication

The Speed Reducer has been filled with oil at the factory. After the initial 100 hours of operation, original oil should be drained and unit refilled with new lubricant. Thereafter, drain and refill every 6 to 8 months or 2000 hours of operation, whichever occurs sooner. Lubricant should be changed more frequently for severe operating conditions. Refer to chart for proper classification of lubricant to be used at any given air temperature. Fill to level shown in Figure 3, depending on orientation.

Recommended Worm Gear Oil AGMA† Classification

Air Temp. °F	AGMA Lubricant No
15-50	7EP
50-125	8EP

(†) American Gear Manufacturer's Assoc.

Models 2Z306F thru 2Z310F

Troubleshooting Chart

Symptom	Possible Causes(s)	Corrective Action
Unit fails to operate	1. Blown fuse or open circuit breaker to motor 2. No power to motor 3. Defective motor	1. Replace fuse or reset circuit breaker 2. Contact power company 3. Repair or replace
Unit operational but no output	Defective gear(s) in reducer	Check and replace if necessary
Intermittent rotation of output shaft caused by shock load	Damaged gear assembly possibly	Replace gear and if possible, avoid shock load
Excessive noise	1. Bearings worn 2. Belt too tight 3. Overhung Load - exceeds rating and causes bearing wear 4. Cover loose due to vibration and causing excess bearing free play.	1. Replace 2. Adjust tension 3. Correct load and/or replace bearing 4. Correctly tighten cover screws to 10 ft-lbs torque

For Repair Parts, call 1-800-323-0620

24 hours a day - 365 days a year

Please provide the following information:

- Model number
- Serial number (if any)
- Part description and number as shown in parts list

Address parts correspondence to:

Grainger Parts
P. O. Box 3074
1657 Shermer Road
Northbrook, IL 60065-3074 U.S.A.

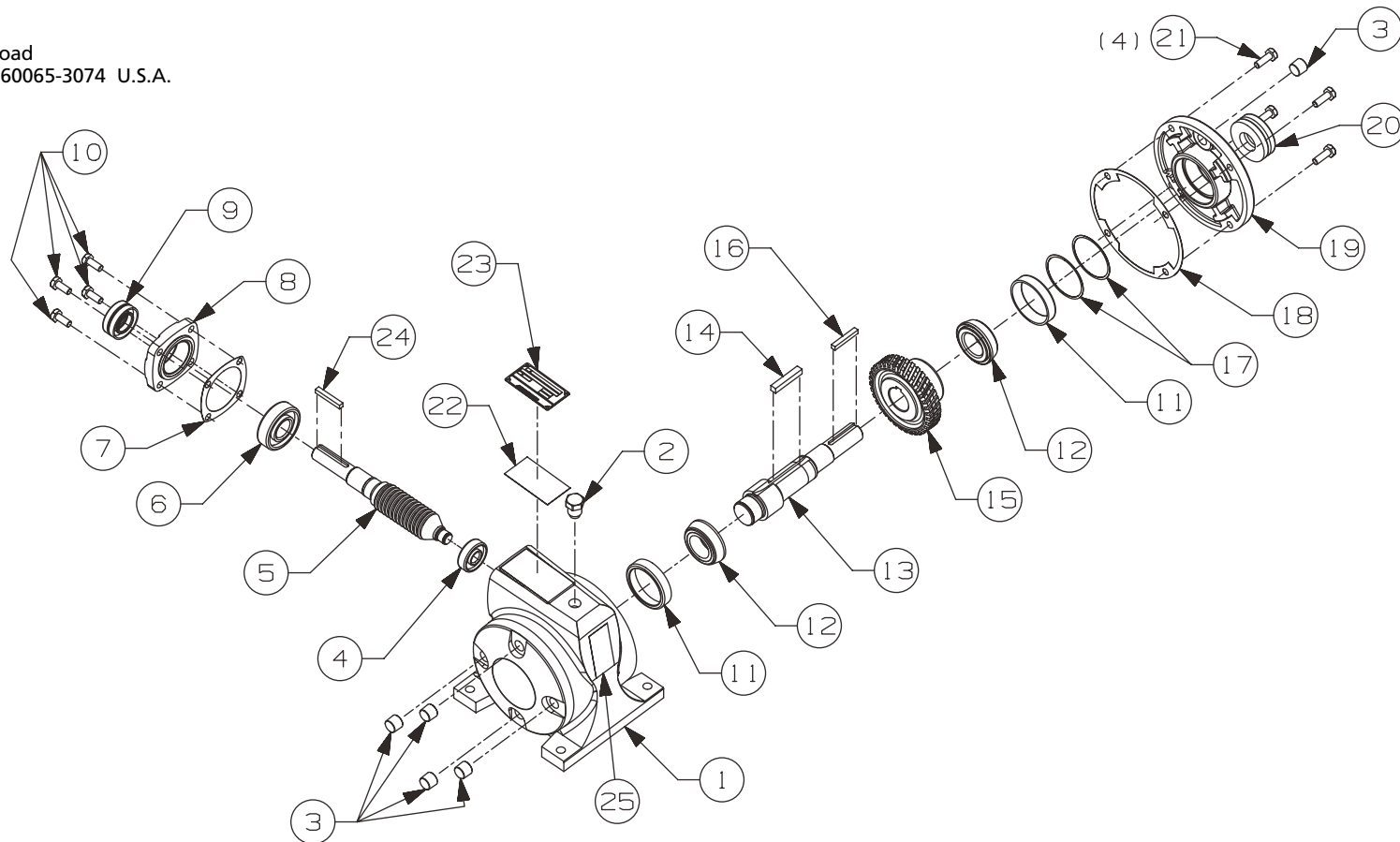


Figure 5 – Repair Parts Illustration

Repair Parts List

Reference Number	Description		Part No.	Qty	Reference Number	Description		Part No.	Qty
1	Gear housing		XG20-1	1	16	Key-projecting output-XK3-3-20.5		Kit 19282	1
2	Vent plug		XVP-4-18M	1	17	Output bearing shim		XG20-39	5
3	Pipe plugs		XSHPP-4	5	18	Cover gasket		XG20-45A	1
4	Input ball bearing-back		XBB-12-32-10M	1	19	Gear housing cover		XG20-16	1
5†	Input Shaft	Model	See Kit		20	Oil seal-output		XOS-13-28-4	2
	XG20-7-11 Ratio 11:1	2Z306F	84261	1	21	Hex head capscrews (Hsg/Cover)		XL420-12	4
	XG20-7-18 Ratio 18:1	2Z307F	84262	1	22	Nameplate tape		XNP-TAPE-2	1
	XG20-7-26 Ratio 26:1	2Z308F	84263	1	23	Nameplate		XNP-335	1
	XG20-7-39 Ratio 39:1	2Z309F	84264	1	24	Key-projecting input-XK3-3-20.5		Kit 19282	1
	XG20-7-58 Ratio 58:1	2Z310F	84265	1	25	Label-oil		XLAB-49	1
6	Input ball bearing-front		XBB-20-47-14M	1	*	Anti-seize compound		XLT-1	1
7	Input gasket		XG20-45	1	*	Cover-clear 2D Label		XLAB-2D-Cover	1
8	Input bearing retainer		XG20-19	1	*	2D Label-Blank		XLAB-2D-Blank	1
9	Oil seal-input		XOS-12-22-4	2					
10	Hex head capscrew		XL420-12	4					
11	Output bearing cup		L44610	2					
12	Output bearing cone		L44643	2					
13	Output shaft		XG20-3A	1					
14	Key-worm gear		XK4-4-23.5	1					
15†	Worm Gear		See Kit						
	XG20-2-11 Ratio 11:1	2Z310F	84261	1					
	XG20-2-18 Ratio 18:1	2Z309F	84262	1					
	XG20-2-26 Ratio 26:1	2Z308F	84263	1					
	XG20-2-39 Ratio 39:1	2Z307F	84264	1					
	XG20-2-58 Ratio 58:1	2Z306B	84265	1					

(*) Not shown

(†)Item 5 & 15 are furnished as a worm & gear kit

Dayton® Speed Reducers

LIMITED WARRANTY

DAYTON ONE-YEAR LIMITED WARRANTY. Dayton Speed Reducers, Models covered in this manual, are warranted by Dayton Electric Mfg. Co. (Dayton) to the original user against defects in workmanship or materials under normal use for one year after date of purchase. Any part which is determined by Dayton to be defective in material or workmanship and returned to an authorized service location, as Dayton designates, shipping costs prepaid, will be, as the exclusive remedy, repaired or replaced at Dayton's option. For limited warranty claim procedures, see PROMPT DISPOSITION below. This limited warranty gives purchasers specific legal rights which vary from jurisdiction to jurisdiction.

LIMITATION OF LIABILITY. To the extent allowable under applicable law, Dayton's liability for consequential and incidental damages is expressly disclaimed. Dayton's liability in all events is limited to and shall not exceed the purchase price paid.

WARRANTY DISCLAIMER. Dayton has made a diligent effort to provide product information and illustrate the products in this literature accurately, however, such information and illustrations are for the sole purpose of identification, and do not express or imply a warranty that the products are MERCHANTABLE, or FIT FOR A PARTICULAR PURPOSE, or that the products will necessarily conform to the illustrations or descriptions. Except as provided below, no warranty or affirmation of fact expressed or implied, other than as stated in the "LIMITED WARRANTY" above is made or authorized by Dayton.

PRODUCT SUITABILITY. Many jurisdictions have codes and regulations governing sales, construction, installation, and/or use of products for certain purposes, which may vary from those in neighboring areas. While Dayton attempts to assure that its products comply with such codes, it cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Before purchase and use of a product review the product applications, and all applicable national and local codes and regulations, and be sure that the product installation, and use will comply with them. Certain aspects of disclaimers are not applicable to consumer products, e.g., (a) some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you, (b) also, some jurisdictions do not allow a limitation on how long an implied warranty lasts, consequently the above limitation may not apply to you, and (c) by law, during the period of this Limited Warranty, any implied warranties of implied merchantability or fitness for a particular purpose applicable to consumer products purchased by consumers, may not be excluded or otherwise disclaimed.

PROMPT DISPOSITION. Dayton will make a good faith effort for prompt correction or other adjustment with respect to any product which proves to be defective within limited warranty. For any product believed to be defective within limited warranty, first write or call dealer from whom the product was purchased. Dealer will give additional directions. If unable to resolve satisfactorily, write to Dayton at address below, giving dealer's name, address, date, and number of dealer's invoice, and describing the nature of the defect. Title and risk of loss pass to buyer on delivery to common carrier. If product was damaged in transit to you, file claim with carrier.

Manufactured for Dayton Electric Mfg. Co., 5959 W. Howard St., Niles, Illinois 60714 U.S.A.

Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

Dayton® Speed Reducers

Description

These Dayton Speed Reducers are in-line drive type units suitable for general purpose applications involving shop equipment, conveyors, etc. Each unit is equipped with heavy duty steel helical gears, tapered roller bearing, lip-type seals and cast iron housing.

NOTE: The speed reducer is built for direct drive with a 1/4, 1/3, or 1/2 HP NEMA 56C face, 1725 RPM (maximum) motor, purchased separately. For additional information pertaining to a specific model in this series refer to Specifications.

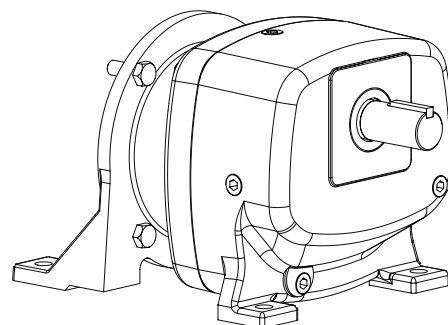


Figure 1

Dimensions

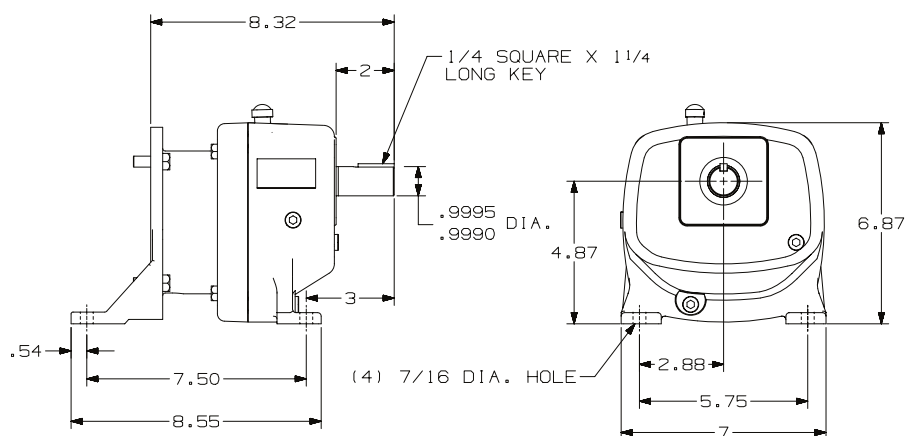


Figure 2

General Safety Information

1. Follow all local electrical and safety codes, the United States National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA).
2. Motor (not included with this unit) must be securely and adequately grounded. This can be accomplished by wiring with a grounded, metal-clad raceway system, by using a separate ground wire connected to the bare metal of the motor frame, or other suitable means. Refer to United States NEC Article 250 (Grounding) for additional information.
3. Always disconnect power source before working on or near a motor or its connected load. If the power disconnect point is out of sight, lock

Specifications

Model	Nominal Output RPM*	Nominal Ratio	1/4 HP Torque In-Lbs*	1/3 HP Torque In-Lbs*	1/2 HP Torque In-Lbs	Finish
22932F	30	57.5:1	470	638	955	Gray
22933F	44	39:1	320	435	651	Gray
22934F	60	29:1	235	318	478	Gray
22935F	91	19:1	160	217	326	Gray

(*) At 1725 RPM (maximum) motor input speed.

Dayton® Speed Reducers

- it in the open position and tag it to prevent unexpected application of power.
4. All moving parts should be guarded.
 5. Be careful when touching the exterior of an operating motor; it may be hot enough to be painful or cause injury. Modern-design motors run hot when operated at rated load and voltage.
 6. Protect the power cable from coming in contact with sharp objects.
 7. Do not kink the power cable and never allow the cable to come in contact with oil, grease, hot surfaces, or chemicals.
 8. Make certain that the power source conforms to the requirements of your equipment.
 9. Before energizing the motor which drives the speed reducer, be sure that the reducer output shaft key is either fully captive, or is removed.
 10. Clean electrical or electronic equipment with approved cleaning agent such as dry cleaning solvent.

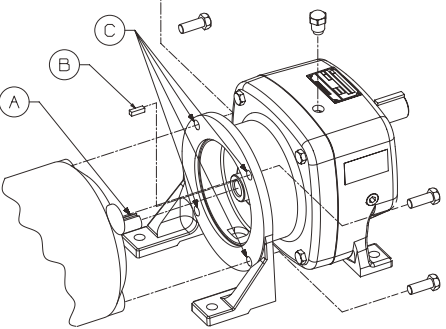
Installation

▲WARNING When an installation involves a holding or overhauling application (such as a hoist or conveyor), a separate magnetic brake or other locking device should be used. Do not depend on gear friction to hold the load.

1. Locate the speed reducer in a clean and dry area with access to adequate motor cooling air supply. If installation is outdoors, make certain that the unit is protected from the weather.
2. Mount unit to a rigid surface, preferably metallic using largest bolts that will fit through the base holes.

- NOTE:** The speed reducer is intended for horizontal floor, wall, or ceiling mounting only. (The output shaft must be horizontal).
3. For shipment, 4 pipe plugs are packed separately. After mounting unit in position as instructed in step 2, remove pipe plug located in highest position, and install vent plug in its place. (Correct oil level for mounted unit is just below pipe plug in side position).
 4. Attach motor to speed reducer. (See Figure 3).

- ▲CAUTION** Do not exceed motor HP and torque rating indicated on nameplate in Specifications.
- a. Speed reducer is to be used with any NEMA Frame 56C face mounted, 1725 RPM electric motor (max. 1/3 HP) without feet. Make sure motor shaft is clean and free of dirt. Lubricate input shaft bore with heavy grease or anti-seize compound provided with reducer.



- Figure 2 - Attaching the Motor**
- ▲CAUTION** Do not use key supplied with motor. Use short key supplied with reducer. (Failure to use short key makes assembly impossible).
- b. Insert short key (B in Figure 3) into

reducer shaft sleeve. Line up keyway in 5/8" diameter motor shaft (A in Figure 3) with keyway in reducer shaft sleeve. Carefully insert motor shaft until C face of motor fits into place against reducer, with four mounting holes in reducer (C in Figure 3) lined up with tapped holes in motor C face.

- ▲CAUTION** Do not force shaft into coupling.
- c. Four screws to fit the tapped holes in the motor face are supplied for mounting. Insert two screws in the two upper holes, but do not tighten completely. Insert lower two screws finger-tight and then back off 3/4 turn. Tighten upper two screws. Then tighten lower two screws.
 - d. Run motor momentarily and then turn off. Motor should coast freely to indicate no binding in motor shaft.
 - e. To reverse direction of reducer rotation, reverse motor leads.

5. Attaching (coupling) the load:

NOTE: To determine output torque capacity for operating conditions other than a normal 8 hour day and shock free operation, multiply the rated output torque (see Specifications) by the applicable load factor listed below. Shock loads should be avoided,

Load Factor Chart	
Type of Load	Load Factor
8 to 10 hour Day Service	
With Moderate Shock Loads	0.85
24 Hour Day Service	
With No Shock Load Involved	0.93
24 Hour Service	
With Moderate Shock Loads	0.81

Dayton®

For Repair Parts, call 1-800-323-0620

24 hours a day - 365 days a year

Please provide the following information:

- Model number
- Serial number (if any)
- Part description and number as shown in parts list

Address parts correspondence to:

Grainger Parts
P. O. Box 3074
1657 Shermer Road
Northbrook, IL 60065-3074 U.S.A.

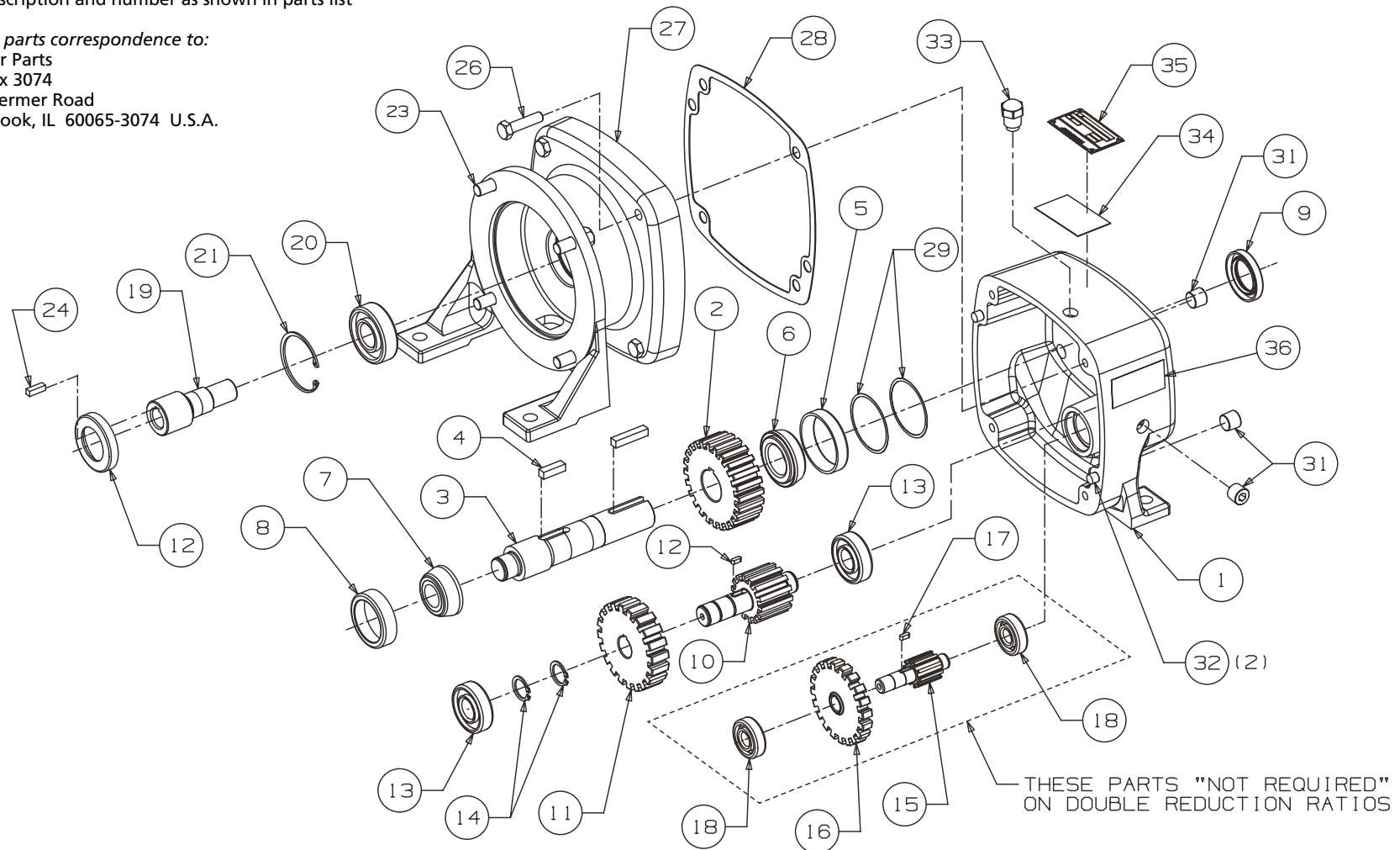


Figure 3 – Repair Parts Illustration

Repair Parts List

Ref. No.	Description	Model 2Z932F Part No.	Qty	Model 2Z933F Part No.	Qty	Model 2Z934F Part No.	Qty	Model 2Z935F Part No.	Qty
1	Gear housing	X2Z-1	1	X2Z-1	1	X2Z-1	1	X2Z-1	1
2	Output gear	46T (Kit 84396)	1	46T (Kit 84396)	1	41T (Kit 84399)	1	48T (Kit 84395)	1
3	Output shaft	XG2Z-3A	1	XG2Z-3A	1	XG2Z-3A	1	XG2Z-3A	1
4	Key - output gear	XK4-4-13-101	1	XK4-4-13-101	1	XK4-4-13-101	1	XK4-4-13-101	1
5	Output shaft bearing cup front	L44610	1	L44610	1	L44610	1	L44610	1
6	Output shaft bearing cone front	L44643	1	L44643	1	L44643	1	L44643	1
7	Output shaft bearing cone back	LM11949	1	LM11949	1	LM11949	1	LM11949	1
8	Output shaft bearing cup back	LM11910	1	LM11910	1	LM11910	1	LM11910	1
9	Oil seal-output	XOS-16-26-4	1	XOS-16-26-4	1	XOS-16-26-4	1	XOS-16-26-4	1
10	Third reduction pinion	19T (Kit 84396)	1	19T (Kit 84396)	1	21T (Kit 84399)	1	17T (Kit 84395)	1
11	Second reduction gear	54T (Kit 84394)	1	54T (Kit 84394)	1	64T (Kit 84397)	1	-----	-
12	Key-second reduction gear	XKF3-3-8	1	XKF3-3-8	1	XKF3-3-8	1	XKF3-3-8	1
13	Ball bearing-second reduction	XBB-17-40-12M	2	XBB-17-40-12M	2	XBB-17-40-12M	2	XBB-17-40-12M	2
14	Snap ring	XTR5100-66	2	XTR5100-66	2	XTR5100-66	2	XTR5100-66	2
15	Second reduction pinion	15T (Kit 84394)	1	15T (Kit 84394)	1	19T (Kit 84397)	1	-----	-
16	First reduction gear	85T (Kit 84393)	1	58T (Kit 84391)	1	58T (Kit 84391)	1	85T (Kit 84392)	1
17	Key - first reduction gear	XKF2-2-5.5	1	XKF2-2-5.5	1	XKF2-2-5.5	1	-----	-
18	Ball bearing-first reduction	XBB-12-32-10M	2	XBB-12-32-10M	2	XBB-12-32-10M	2	-----	-
19	First reduction pinion	13T (Kit 84393)	1	13T (Kit 84391)	1	13T (Kit 84391)	1	13T (Kit 84392)	1
20	Ball bearing-input	XBB-20-47-14M	1	XBB-20-47-14M	1	XBB-20-47-14M	1	XBB-20-47-14M	1
21	Snap ring	XTRN5000-185	1	XTRN5000-185	1	XTRN5000-185	1	XTRN5000-185	1
22	Oil seal-input	XOS-18-29.6-5	1	XOS-18-29.6-5	1	XOS-18-29.6-5	1	XOS-18-29.6-5	1
23	Hex capscrews (3/8-16 X 1" LG)	84383	1	84383	1	84383	1	84383	1
24	Key (3/16 SQ. X 5/8 LG)	84383	1	84383	1	84383	1	84383	1
25	Label-caution	84383	1	84383	1	84383	1	84383	1
26	Hex head capscrews (Hsg/Cover)	XL518-24	4	XL518-24	4	XL518-24	4	XL518-24	4
27	Gear cover	X2Z-31	1	X2Z-31	1	X2Z-31	1	X2Z-31	1
28	Gasket	XG2Z-40	1	XG2Z-40	1	XG2Z-40	1	XG2Z-40	1
29	Output bearing cup shim	XG20-39	3	XG20-39	3	XG20-39	3	XG20-39	3
30	Key 1/4 SQ. X 1-1/4 LG	50074	1	50074	1	50074	1	50074	1
31	Pipe plugs	XSHPP-4	4	XSHPP-4	4	XSHPP-4	4	XSHPP-4	4
32	Dowel pins	XDP516-12	2	XDP516-12	2	XDP516-12	2	XDP516-12	2
33	Vent plug	XVP-4-18M	1	XVP-4-18M	1	XVP-4-18M	1	XVP-4-18M	1
34	Nameplate	XNP-335	1	XNP-335	1	XNP-335	1	XNP-335	1
35	Nameplate tape	XNP-TAPE-2	1	XNP-TAPE-2	1	XNP-TAPE-2	1	XNP-TAPE-2	1
36	Label-oil	XLAB-49	1	XLAB-49	1	XLAB-49	1	XLAB-49	1
▲	Anti-seize compound	XLT-1	1	XLT-1	1	XLT-1	1	XLT-1	1
▲	Cover-clear 2D Label	XLAB-2D-Cover	1	XLAB-2D-Cover	1	XLAB-2D-Cover	1	XLAB-2D-Cover	1
▲	2D Label-Blank	XLAB-2D-Blank	1	XLAB-2D-Blank	1	XLAB-2D-Blank	1	XLAB-2D-BLANK	1

(▲) Not shown

Items 2 & 10 sold as kit only

Items 11 & 15 sold as kit only

Items 16 & 19 sold as kit only

Dayton® Speed Reducers

[illegible]

Models 2Z932F thru 2Z935F

Troubleshooting Chart

Symptom	Possible Causes(s)	Corrective Action
Unit fails to operate	1. Blown fuse or open circuit breaker 2. No power 3. Defective motor 4. Excessive load	1. Replace fuse or reset circuit breaker 2. Contact power company 3. Repair or replace 4. Reduce load
Motor runs but no output	1. No input key 2. Defective gear(s)	1. Install key (see installation) 2. Check and replace if necessary
Intermittent rotation of output shaft	1. Poor electrical connection 2. Damaged gear assembly possibly caused by shock load	1. Check connection 2. Replace gear and if possible, avoid shock load
Excessive noise	1. Bearings worn 2. Belt too tight 3. Overhung Load - exceeds rating and causes bearing wear 4. Insufficient lubrication	1. Replace 2. Adjust tension 3. Correct load and/or replace bearing 4. Check oil level
Oil leak	1. Vent plug not installed 2. Gasket broken or not seated 3. Damaged or worn seal 4. Too much oil	1. Install vent plug 2. Replace or reseal gasket 3. Replace seal 4. Check oil level

Dayton® Speed Reducers

LIMITED WARRANTY

DAYTON ONE-YEAR LIMITED WARRANTY. Dayton Speed Reducers, Models covered in this manual are warranted by Dayton Electric Mfg. Co. (Dayton) to the original user against defects in workmanship or materials under normal use for one year after date of purchase. Any part which is determined by Dayton to be defective in material or workmanship and returned to an authorized service location, as Dayton designates, shipping costs prepaid, will be, as the exclusive remedy, repaired or replaced at Dayton's option. For limited warranty claim procedures, see PROMPT DISPOSITION below. This limited warranty gives purchasers specific legal rights which vary from jurisdiction to jurisdiction.

LIMITATION OF LIABILITY. To the extent allowable under applicable law, Dayton's liability for consequential and incidental damages is expressly disclaimed. Dayton's liability in all events is limited to and shall not exceed the purchase price paid.

WARRANTY DISCLAIMER. Dayton has made a diligent effort to provide product information and illustrate the products in this literature accurately, however, such information and illustrations are for the sole purpose of identification, and do not express or imply a warranty that the products are MERCHANTABLE, or FIT FOR A PARTICULAR PURPOSE, or that the products will necessarily conform to the illustrations or descriptions. Except as provided below, no warranty or affirmation of fact expressed or implied, other than as stated in the "LIMITED WARRANTY" above is made or authorized by Dayton.

PRODUCT SUITABILITY. Many jurisdictions have codes and regulations governing sales, construction, installation, and/or use of products for certain purposes, which may vary from those in neighboring areas. While Dayton attempts to assure that its products comply with such codes, it cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Before purchase and use of a product review the product applications, and all applicable national and local codes and regulations, and be sure that the product installation, and use will comply with them. Certain aspects of disclaimers are not applicable to consumer products, e.g., (a) some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you, (b) also, some jurisdictions do not allow a limitation on how long an implied warranty lasts, consequently the above limitation may not apply to you, and (c) by law, during the period of this Limited Warranty, any implied warranties of implied merchantability or fitness for a particular purpose applicable to consumer products purchased by consumers, may not be excluded or otherwise disclaimed.

PROMPT DISPOSITION. Dayton will make a good faith effort for prompt correction or other adjustment with respect to any product which proves to be defective within limited warranty. For any product believed to be defective within limited warranty, first write or call dealer from whom the product was purchased. Dealer will give additional directions. If unable to resolve satisfactorily, write to Dayton at address below, giving dealer's name, address, date, and number of dealer's invoice, and describing the nature of the defect. Title and risk of loss pass to buyer on delivery to common carrier. If product was damaged in transit to you, file claim with carrier.

Manufactured for Dayton Electric Mfg. Co., 5959 W. Howard St., Niles, Illinois 60714 U.S.A.

480 SERIES

482 Series Split Phase 115V > 014-482-4029



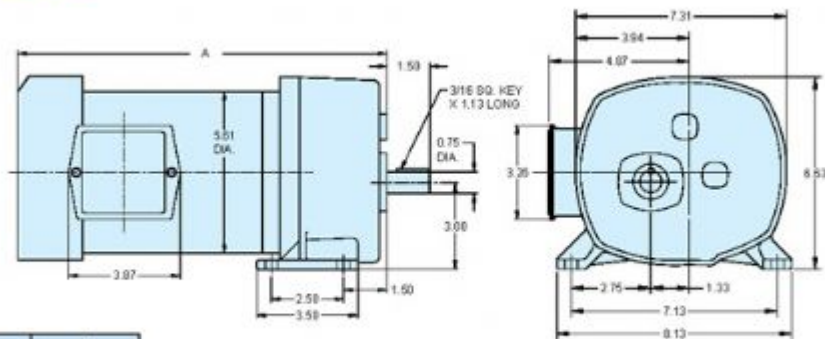
QUICK SPECS

Stages	2	OHL*	636
Approx Weight	28	Voltage	115
Speed (RPM)	60	Torque (in-lbs)	240
Input HP	1/4	Ratio:1	28.6
Amps	3.97	Hz	60
Enclosure	TEFC		

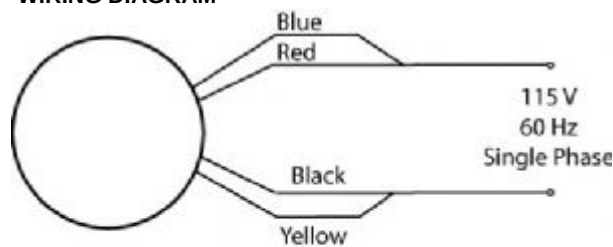
* Maximum overhung load on center of output shaft

CAD DRAWING

Model 480 AC



WIRING DIAGRAM



To Reverse, interchange blue and yellow leads.

480 Series Split Phase
115 V AC 1/4, 1/3 and 1/2 hp

SPECIFICATIONS

Gearhead Specifications

Housing: Precision machined die cast aluminum.
Lubrication: Lifetime oil bath, sealed and gasketed.

Shafts: Hardened steel.
Mounting: Foot, (any angle) on 482; Face (any angle) or optional footplate on 485
Gearing: AGMA class 9 heat treated steel. 1st stage helical metal, balance spur metal.
Bearings: Ball Output and Needle.

Motor Specifications

Motor Type: Split Phase on 482; 3-Phase Inverter Duty on 485
Rotation: Reversible.
Insulation: Class B minimum.
Finish: Powder-coat gloss black.
Bearings: Ball

Features

- Included junction box.



Integral Horsepower DC Motor

Installation & Operating Manual

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Section 1

General Information

Overview This manual contains general procedures that apply to Baldor Motor products. Be sure to read and understand the Safety Notice statements in this manual. For your protection, do not install, operate or attempt to perform maintenance procedures until you understand the Warning and Caution statements. A Warning statement indicates a possible unsafe condition that can cause harm to personnel. A Caution statement indicates a condition that can cause damage to equipment.

Important: **This instruction manual is not intended to include a comprehensive listing of all details for all procedures required for installation, operation and maintenance. This manual describes general guidelines that apply to most of the motor products shipped by Baldor. If you have a question about a procedure or are uncertain about any detail, Do Not Proceed. Please contact your Baldor distributor for more information or clarification.**

Before you install, operate or perform maintenance, become familiar with the following:

- NEMA Publication MG 2, Safety Standard for Construction and guide for Selection, Installation and Use of Electric Motors and Generators.
- The National Electrical Code
- Local codes and Practices

Limited Warranty

1. Baldor Electric motors are warranted for a period of one (1) year, from date of shipment from the factory or factory warehouse against defects in material and workmanship. To allow for stocking and/or fabrication period and to provide one year of actual service, the warranty period is extended for an additional period of six (6) months for a total of eighteen (18) months from the original date of shipment from the factory or factory warehouse stock. In no case will the warranty period be extended for a longer period. Baldor extends this limited warranty to each buyer of the electric motor for the purpose of resale and to the original purchaser for use.
2. Baldor will, at its option repair or replace a motor which fails due to defects in material or workmanship during the warranty period if:
 - a. the purchaser presents the defective motor at or ships it prepaid to, the Baldor plant in Fort Smith, Arkansas or one of the Baldor Authorized Service Centers and
 - b. the purchaser gives written notification concerning the motor and the claimed defect including the date purchased, the task performed by the Baldor motor and the problem encountered.
3. Baldor will not pay the cost of removal of any electric motor from any equipment, the cost of delivery to Fort Smith, Arkansas or a Baldor Authorized Service Center, or the cost of any incidental or consequential damages resulting from the claimed defects. (Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply to you.) Any implied warranty given by laws shall be limited to the duration of the warranty period hereunder. (Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.)
4. Baldor Authorized Service Centers, when convinced to their satisfaction that a Baldor motor developed defects in material or workmanship within the warranty period, are authorized to proceed with the required repairs to fulfill Baldor's warranty when the cost of such repairs to be paid by Baldor does not exceed Baldor's warranty repair allowance. Baldor will not pay overtime premium repair charges without prior written authorization.
5. The cost of warranty repairs made by centers other than Baldor Authorized Service Centers **WILL NOT** be paid unless first authorized in writing by Baldor.
6. Claims by a purchaser that a motor is defective even when a failure results within one hour after being placed into service are not always justified. Therefore, Baldor Authorized Service Centers must determine from the condition of the motor as delivered to the center whether or not the motor is defective. If in the opinion of a Baldor Authorized Service Center, a motor did not fail as a result of defects in material or workmanship, the center is to proceed with repairs only if the purchaser agrees to pay for such repairs. If the decision is in dispute, the purchaser should still pay for the repairs and submit the paid invoice and the Authorized Service Center's signed service report to Baldor for further consideration.
7. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Safety Notice:

This equipment contains high voltage! Electrical shock can cause serious or fatal injury. Only qualified personnel should attempt installation, operation and maintenance of electrical equipment.

Be sure that you are completely familiar with NEMA publication MG 2, safety standards for construction and guide for selection, installation and use of electric motors and generators, the National Electrical Code and local codes and practices. Unsafe installation or use can cause conditions that lead to serious or fatal injury. Only qualified personnel should attempt the installation, operation and maintenance of this equipment.

- WARNING:** Do not touch electrical connections before you first ensure that power has been disconnected. Electrical shock can cause serious or fatal injury. Only qualified personnel should attempt the installation, operation and maintenance of this equipment.
- WARNING:** Be sure the system is properly grounded before applying power. Do not apply power before you ensure that all grounding instructions have been followed. Electrical shock can cause serious or fatal injury. National Electrical Code and Local codes must be carefully followed.
- WARNING:** Avoid extended exposure to machinery with high noise levels. Be sure to wear ear protective devices to reduce harmful effects to your hearing.
- WARNING:** This equipment may be connected to other machinery that has rotating parts or parts that are driven by this equipment. Improper use can cause serious or fatal injury. Only qualified personnel should attempt to install operate or maintain this equipment.
- WARNING:** Do not by-pass or disable protective devices or safety guards. Safety features are designed to prevent damage to personnel or equipment. These devices can only provide protection if they remain operative.
- WARNING:** Avoid the use of automatic reset devices if the automatic restarting of equipment can be hazardous to personnel or equipment.
- WARNING:** Be sure the load is properly coupled to the motor shaft before applying power. The shaft key must be fully captive by the load device. Improper coupling can cause harm to personnel or equipment if the load decouples from the shaft during operation.
- WARNING:** Use proper care and procedures that are safe during handling, lifting, installing, operating and maintaining operations. Improper methods may cause muscle strain or other harm.
- WARNING:** Before performing any motor maintenance procedure, be sure that the equipment connected to the motor shaft cannot cause shaft rotation. If the load can cause shaft rotation, disconnect the load from the motor shaft before maintenance is performed. Unexpected mechanical rotation of the motor parts can cause injury or motor damage.
- WARNING:** Disconnect all electrical power from the motor windings and accessory devices before disassembly of the motor. Electrical shock can cause serious or fatal injury.
- WARNING:** Do not use these motors in the presence of flammable or combustible vapors or dust. These motors are not designed for atmospheric conditions that require explosion proof construction.

Safety Notice Continued

- WARNING:** UL listed motors must only be serviced by authorized Baldor Service Centers if these motors are to be returned to a flammable and/or explosive atmosphere.
- WARNING:** Thermostat contacts automatically reset when the motor has slightly cooled down. To prevent injury or damage, the control circuit should be designed so that automatic starting of the motor is not possible when the thermostat resets.
- Caution:** To prevent premature equipment failure or damage, only qualified maintenance personnel should perform maintenance.
- Caution:** Do not lift the motor and its driven load by the motor lifting hardware. The motor lifting hardware is adequate for lifting only the motor. Disconnect the load from the motor shaft before moving the motor.
- Caution:** If eye bolts are used for lifting a motor, be sure they are securely tightened. The lifting direction should not exceed a 20° angle from the shank of the eye bolt or lifting lug. Excessive lifting angles can cause damage.
- Caution:** To prevent equipment damage, be sure that the electrical service is not capable of delivering more than the maximum motor rated amps listed on the rating plate.
- Caution:** If a HI POT test (High Potential Insulation test) must be performed, follow the precautions and procedure in NEMA MG 1 and MG 2 standards to avoid equipment damage.

If you have any questions or are uncertain about any statement or procedure, or if you require additional information please contact your Baldor distributor or an Authorized Baldor Service Center.

Receiving

Each Baldor Electric Motor is thoroughly tested at the factory and carefully packaged for shipment. When you receive your motor, there are several things you should do immediately.

1. Observe the condition of the shipping container and report any damage immediately to the commercial carrier that delivered your motor.
2. Verify that the part number of the motor you received is the same as the part number listed on your purchase order.

Storage

If the motor is not put into service immediately, the motor must be stored in a clean, dry and warm location. Several precautionary steps must be performed to avoid motor damage during storage.

1. Use a "Megger" periodically to ensure that the integrity of the winding insulation has been maintained. Record the Megger readings. Immediately investigate any significant decrease in insulation resistance.
2. Do not lubricate bearings during storage. Motor bearings are packed with a slushing compound at the factory.
3. Rotate motor shaft at least 10 turns every two months during storage (more frequently if possible). This will prevent bearing damage due to storage.
4. If the storage location is damp or humid, the motor windings must be protected from moisture. This can be done by applying power to the motors' space heater (if available) while the motor is in storage.

Unpacking

Each Baldor motor is packaged for ease of handling and to prevent entry of contaminants.

1. To avoid condensation inside the motor, do not unpack until the motor has reached room temperature. (Room temperature is the temperature of the room in which it will be installed). The packing provides insulation from temperature changes during transportation.
2. When the motor has reached room temperature, remove all protective wrapping material from the motor.

Handling

The motor should be lifted using the lifting lugs or eye bolts provided.

1. Use the lugs or eye bolts provided to lift the motor. Never attempt to lift the motor and additional equipment connected to the motor by this method. The lugs or eye bolts provided are designed to lift only the motor. Never lift the motor by the motor shaft.
2. If the motor must be mounted to a plate with the driven equipment such as pump, compressor etc., it may not be possible to lift the motor alone. For this case, the assembly should be lifted by a sling around the mounting base. The entire assembly can be lifted for installation. Do not lift using the motor lugs or eye bolts provided.

If the load is unbalanced (as with couplings or additional attachments) additional slings or other means must be used to prevent tipping. In any event, the load must be secure before lifting.

Lifting Magnet Generators

Treat Baldor lifting magnet generators like motors during installation or maintenance. Generally, they have standard compound self-excited fields. Standard magnetism is for counter-clockwise rotation (facing the drive end of the motor). To reverse (operate clockwise), refer to the connection diagrams in Section 4 of this manual.

Section 2

Installation & Operation

Overview

Installation should conform to the National Electrical Code as well as local codes and practices. When other devices are coupled to the motor shaft, be sure to install protective devices to prevent future accidents. Some protective devices include, coupling, belt guard, chain guard, shaft covers etc. These protect against accidental contact with moving parts. Machinery that is accessible to personnel should provide further protection in the form of guard rails, screening, warning signs etc.

Location

The motor should be installed in an area that is protected from direct sunlight, corrosives, harmful gases or liquids, dust, metallic particles, and vibration. Exposure to these can reduce the operating life and degrade performance. Be sure to allow clearance for ventilation and access for cleaning, repair, service and inspections. Ventilation is extremely important. Be sure the area for ventilation is not obstructed. Obstructions will limit the free passage of air. Motors get warm and the heat must be dissipated to prevent damage.

These motors are not designed for atmospheric conditions that require explosion proof operation. They must **NOT** be used in the presence of flammable or combustible vapors or dust.

TEFC motors can be used for indoor or outdoor standard service. They cannot be used outdoors where they would be exposed to freezing rain. Standard TEFC motors are not designed for atmospheric conditions requiring explosion-proof operation, such as flammable or combustible vapors or dust.

Mounting

The motor must be securely installed to a rigid foundation or mounting surface to minimize vibration and maintain alignment between the motor and shaft load. Failure to provide a proper mounting surface may cause vibration, misalignment and bearing damage.

Foundation caps and sole plates are designed to act as spacers for the equipment they support. If these devices are used, be sure that they are evenly supported by the foundation or mounting surface.

After installation is complete and accurate alignment of the motor and load is accomplished, the base should be grouted to the foundation to maintain this alignment.

The standard motor base is designed for horizontal or vertical mounting. Adjustable or sliding rails are designed for horizontal mounting only. Consult your Baldor distributor or authorized Baldor Service Center for further information.

Alignment

Accurate alignment of the motor with the driven equipment is extremely important.

1. **Direct Coupling**

For direct drive, use flexible couplings if possible. Consult the drive or equipment manufacturer for more information. Mechanical vibration and roughness during operation may indicate poor alignment. Use dial indicators to check alignment. The space between coupling hubs should be maintained as recommended by the coupling manufacturer.

2. **End-Play Adjustment**

The axial position of the motor frame with respect to its load is also extremely important. The motor bearings are not designed for excessive external axial thrust loads. Improper adjustment will cause failure.

3. **Pulley Ratio**

The pulley ratio should not exceed 8:1. Consult your Baldor distributor or authorized Baldor Service Center for further information.

4. **Belt Drive**

Refer to NEMA MG 1 section 14.07 or Baldor application section for the application of pulleys, sheaves, sprockets, and gears. Align sheaves carefully to minimize belt wear and axial bearing loads (see End-Play Adjustment). Belt tension should be sufficient to prevent belt slippage at rated speed and load. However, belt slippage may occur during starting. Do not over-tension belts.

Doweling & Bolting

After proper alignment is verified, dowel pins should be inserted through the motor feet into the foundation. This will maintain the correct motor position should motor removal be required. (Baldor motors are designed for doweling.)

1. Drill dowel holes in diagonally opposite motor feet in the locations provided.
2. Drill corresponding holes in the foundation.
3. Ream all holes.
4. Install proper fitting dowels.
5. Mounting bolts must be carefully tightened to prevent changes in alignment. Use a flat washer and lock washer under each nut or bolt head to hold the motor feet secure. Flanged nuts or bolts may be used as an alternative to washers.

Power Connection

Motor and control wiring, overload protection, disconnects, accessories and grounding should conform to the National Electrical Code and local codes and practices. Ground the motor by attaching a strap from an established ground point to the grounding bolt provided inside the conduit box.

Conduit Box

For ease of making connections, an oversize conduit box is provided. The box can be rotated 360° in 90° increments.

Power

Connect the motor leads as shown on the connection diagram located on the name plate or inside the cover on the conduit box. Be sure the following guidelines are met:

1. DC power is within $\pm 5\%$ of rated voltage (not to exceed 600VDC).
(See motor name plate for ratings).

OR

2. DC field power is within $\pm 1\%$ of rated voltage.

Motor Connections

Terminal connections should be made as specified. See the connection diagrams located in Section 4 of this manual. Tables 2-1 and 2-2 show the NEMA standard lead markings and the Accessory Markings.

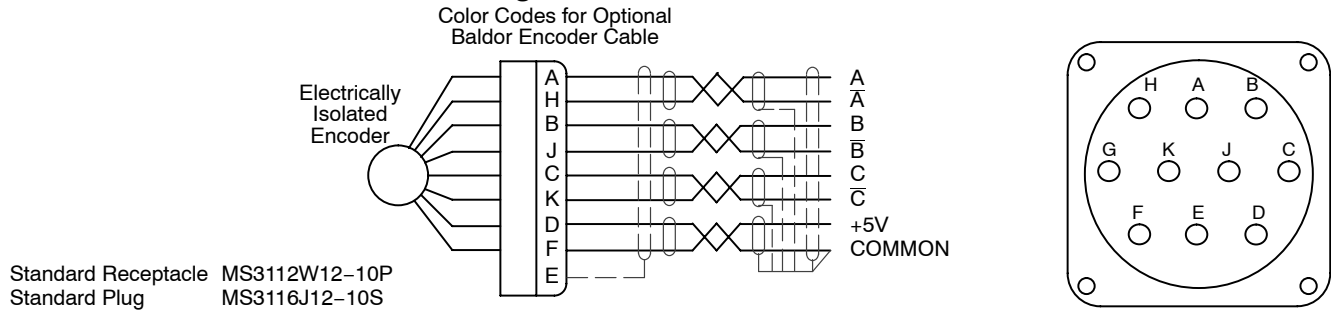
Table 2-1 NEMA Standard Lead Markings

Lead Markings	Motor
Armature	A1, A2
Field (shunt)	F1, F2, F3, F4, etc.
Field (series)	S1, S2
Thermostat	P1, P2, etc.
Space Heater	H1, H2, H3, H4, etc.
Resistance Temperature Detector (RTD)	R1, R2, R3, R4, etc.
Optional Brush Monitor System	A1Probe, A2Probe

Table 2-2 Accessory Markings

DC Tachometers	+	—	
XPY	1	2	G
XC	Red (1)	Black (2)	G
NCS Pancake	Red	Black	
AC Tachometers 45/90V Output			
45V	Red	White	
90V	Red	Black	
Brake Coil Leads	B1, B2, B3, etc.		
Space Heater (Brake)	H1, H2, H3, H4, etc.		
Brake Interlock Switch	BS1, BS2, BS3, etc.		

Figure 2-1 Encoder Connections



Thermostats

The thermostat is a pilot circuit device used in a protective relay circuit. The thermostat ratings are given in Table 2-3.

Table 2-3 Thermostat Ratings

Maximum Current Ratings for Thermostats (Normally Open or Closed Contacts)				
Voltage	125VAC	250VAC	24VDC	Continuous Current All Voltages
Amperage	12A	8A	2A	2A

Initial Start-Up

If driven equipment can be damaged by rotating in the wrong direction, uncouple the motor from the load before checking for rotation.

If the direction of rotation needs to be corrected, disconnect the input power supply and interchange the appropriate leads. Refer to the motor connection diagrams in Section 4 of this manual.

1. The first start-up and running of the motor should be with the motor uncoupled from the load.
2. Check the direction of rotation by momentarily applying power to the motor.
3. With the motor running, make sure it's running smoothly without too much noise or vibration. If either are present, shut down the motor immediately and find the cause of the problem.

Blower Ventilation System

Before loading a force-ventilated motor, be sure that the blowers, cooling fans, or central air supply systems are operating properly to supply cooling air to the motor. Air filters should also be in place. If you energize the main fields with the motor at standstill, the blowers or external cooling systems must be left on. This will prevent excessive heat buildup that will decrease the life of the insulation.

When using field economy circuits to reduce the voltage to the main fields during standstill, blowers do not need to be left on.

Blower motors should be checked for correct rotation. Don't rely on feeling airflow from the drive end of the motor. Look at the outline drawing or rotation arrow shown on the blower housing. Refer to Figure 2-1.

Figure 2-1 View from Air Inlet (Motor is on Opposite Side)

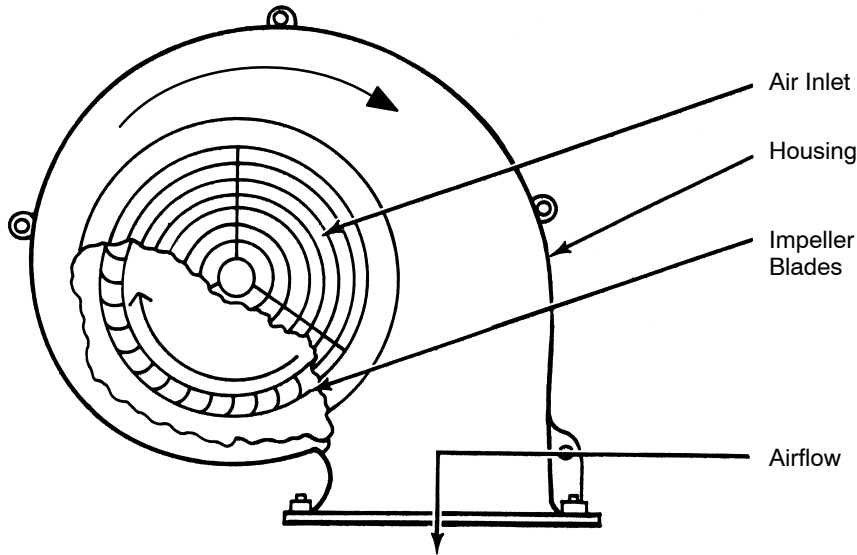


Table 2-4 Electrical Data - Forced Ventilation Blower Units

Size	Motor Frame	HP	RPM	Volts	Phase	Hz	Amps
LM2	180	1/40	3000	230	1	60	0.4
LM3	180	1/8	3450	115/230	1	50/60	2.6/1.3
LM3	210-250	1/8	3450	208-230/460	3	50/60	0.66-0.60/0.30
LM4	280	1/3	3450	208-230/460	3	50/60	1.5-1.4/0.7
LM6	320-400	1	3450	208-230/460	3	50/60	3.1-3.0/1.5
LM8	504-506	3/4	1750	208-230/460	3	50/60	3.4-3.2/1.6
LM9	508-5012	3	3450	208-230/460	3	50/60	8.2-7.6/3.8

Note: Motor mounted blower units. Mount on commutator end (opposite drive end of motor). We supply blowers that are powered by totally enclosed motors (standard). Blowers have a cast aluminum fan housing with washable, wire mesh filters.

Table 2-5 Minimum Blower CFM for DPBV Motors (Drip Proof Blower Ventilated)

Blower Size	Motor Frame Size	Blower CFM	Blower Static Pressure (In H ₂ O)
LM2	180	55	0.50
LM3	180	150	1.45
LM3	210	175	1.45
LM3	250	215	0.78
LM4	280	350	0.88
LM6	320	780	2.80
LM6	360	780	2.80
LM6	400	820	2.50
LM8	504-506	1120	1.58
LM9	508-5012	2000	5.00

Each motor nameplate is stamped with the above data for DPBV (less Blower), DPSV and TEPV enclosures.

Coupled Start-Up

1. After the first successful no load start-up, stop the motor and assemble the coupling.
2. Align the coupling and be sure it is not binding in any way.
3. The first coupled start-up should be without load. Check to see that the driven equipment is not transmitting any vibration back to the motor through the coupling or the base. Vibrations (if any) should be within acceptable levels.
4. Run about 1 hour with driven equipment unloaded.
5. After completing these steps, the motor can now be loaded.
6. Do not exceed the value of armature nameplate amperes under steady continuous loads.



Section 3

Maintenance & Troubleshooting

General Inspection

Inspect the motor at regular intervals, approximately every 500 hours of operation or every 3 months, whichever occurs first. Keep the motor clean and the ventilation openings clear. The following steps should be performed at each inspection:

1. Check that the motor is clean. Check that the interior and exterior of the motor is free of dirt, oil, grease, water, etc. Oily vapor, paper pulp, textile lint, etc. can accumulate and block motor ventilation. If the motor is not properly ventilated, overheating can occur and cause early motor failure.
2. Use a "Megger" periodically to ensure that the integrity of the winding insulation has been maintained. Record the Megger readings. Immediately investigate any significant drop in insulation resistance.
3. Check all electrical connectors to be sure that they are tight.
4. Check for too much vibration or looseness. It may be caused by improper alignment, an unbalanced coupling sheave, damaged motor bearings, or loose mounting bolts. Excessive vibration will damage the motor bearings, brushes and commutator.
5. Listen for unusual noises, especially in the area of the bearings. Also, rubbing or rumbling noises could be signs of internal damage. Check for loose parts on the motor such as thru bolts, hold down bolts, bad alignment of hoods, etc. An unbalanced armature or load may also cause noise.

Note: Motors applied with rectified power supplies will often make a humming noise when operating normally. This is even more noticeable at lower operating speeds. If you can hear a growling or erratic hum, the power supply should be checked for proper operation and phase balance. Improper adjustment or functioning of the power supply can cause overheating of the motor and shorten its life.

6. At start-up, check the tightness of the main and commutating pole bolts (external on the frame) as listed in Table 3-1. Loose pole bolts could be a source of unpleasant noise when rectified power runs the motor.

Table 3-1 Torque Specifications for Commutating and Main Pole Bolts

Frame	Bolt Size	Torque (lb-ft)
180AT	3/8 - 16	24 - 30
210AT	3/8 - 16	24 - 30
250AT	3/8 - 16	24 - 30
280AT	1/2 - 13	60 - 75
320AT	1/2 - 13	60 - 75
360AT	3/8 - 16	24 - 30
400AT	3/8 - 16	24 - 30
500AT	1/2 - 13	60 - 75

Lubrication & Bearings

Bearing grease will lose its lubricating ability over time, not suddenly. The lubricating ability of a grease (over time) depends primarily on the type of grease, the size of the bearing, the speed at which the bearing operates and the severity of the operating conditions. Good results can be obtained if the following recommendations are used in your maintenance program.

Type of Grease

A high grade ball or roller bearing grease should be used. Recommended grease for standard service conditions is Polyrex EM (Exxon Mobil).

Equivalent and compatible greases include:

Texaco Polystar, Rykon Premium #2, Pennzoil Pen 2 Lube and Chevron SRI-2.

- Maximum operating temperature for standard motors = 110° C.
- Shut-down temperature in case of a malfunction = 115° C.

Lubrication Intervals

Recommended lubrication intervals are shown in Table 3-2. It is important to realize that the recommended intervals of Table 3-2 are based on average use.

Refer to additional information contained in Tables 3-3 and 3-4.

Table 3-2 Lubrication Intervals *

NEMA / (IEC) Frame Size	Base Speed - RPM			
	>2500	1750	1150	<800
Up to 210 incl. (132)	5500 Hrs.	12000 Hrs.	18000 Hrs.	22000 Hrs.
Over 210 to 280 incl. (180)	3600 Hrs.	9500 Hrs.	15000 Hrs.	18000 Hrs.
Over 280 to 360 incl. (225)	* 2200 Hrs.	7400 Hrs.	12000 Hrs.	15000 Hrs.
Over 360 to 500 incl. (300)	*2200 Hrs.	3500 Hrs.	7400 Hrs.	10500 Hrs.

* Lubrication intervals are for ball bearings. For roller bearings, divide the listed lubrication interval by 2.

Table 3-3 Service Conditions

Severity of Service	Ambient Temperature Maximum	Atmospheric Contamination	Type of Bearing
Standard	40° C	Clean, Little Corrosion	Deep Groove Ball Bearing
Severe	50° C	Moderate dirt, Corrosion	Ball Thrust, Roller
Extreme	>50° C* or Class H Insulation	Severe dirt, Abrasive dust, Corrosion	All Bearings
Low Temperature	<-30° C **		All Bearings

* Special high temperature grease is recommended (Dow Corning DC44). Note that Dow Corning DC44 grease does not mix with other grease types. Thoroughly clean bearing & cavity before adding grease.

** Special low temperature grease is recommended (Aeroshell 7). Different brushes may also be required. Contact your local Baldor district office or an authorized Baldor service center for technical assistance.

Table 3-4 Lubrication Interval Multiplier

Severity of Service	Multiplier
Standard	1.0
Severe	0.5
Extreme	0.1
Low Temperature	1.0

Table 3-5 Bearings Sizes and Types

Frame Size NEMA (IEC)	Bearing Description (These are the “Large” bearings (Shaft End) in each frame size)					
	Bearing	OD D mm	Width B mm	Weight of Grease to add * oz (Grams)	Volume of grease to be added	
					in ³	tea- spoon
Up to 210 incl. (132)	6307	80	21	0.30 (8.4)	0.6	2.0
Over 210 to 280 incl. (180)	6311	120	29	0.61 (17)	1.2	3.9
Over 280 to 360 incl. (225)	6313	140	33	0.81 (23)	1.5	5.2
Over 360 to 500 incl. (300)	NU319	200	45	2.12 (60)	4.1	13.4

* Weight in grams = .005 DB

Lubrication Procedure

Be sure that the grease you are adding to the motor is compatible with the grease already in the motor. Consult your Baldor distributor or an authorized service center if a grease other than the recommended type is to be used.

Caution: To avoid damage to motor bearings, grease must be kept free of dirt. For an extremely dirty environment, contact your Baldor distributor or an authorized Baldor Service Center for additional information.

With Grease Outlet Plug

1. Clean all grease fittings.
2. Remove grease outlet plug.
3. If motor is stopped, add the recommended amount of grease.

If motor is to be greased while running, a slightly greater quantity of grease will have to be added. Add grease slowly until new grease appears at shaft hole in the endplate or purge outlet plug.

4. Re-install grease outlet plug.

Without Grease Outlet Plug

1. Disassemble motor.
2. Add recommended amount of grease to bearing and bearing cavity. (Bearing should be about 1/3 full of grease and outboard bearing cavity should be about 1/2 full of grease.)

Note: Bearing is 1/3 full when only one side of bearing is completely full of grease.

3. Assemble motor.

Sample Lubrication Determination

Assume - NEMA 286T (IEC 180), 1750 RPM motor driving an exhaust fan in an ambient temperature of 43° C and the atmosphere is moderately corrosive.

1. Table 3-2 list 9500 hours for standard conditions.
2. Table 3-3 classifies severity of service as “Severe”.
3. Table 3-4 lists a multiplier value of 0.5 for Severe conditions.
4. Table 3-5 shows that 1.2 in³ or 3.9 teaspoon of grease is to be added.

Note: Smaller bearings in size category may require reduced amounts of grease.

Brush Replacement

Do not change brush grades or suppliers without first contacting Baldor for technical assistance.

Brush life will vary greatly due to motor load conditions and the operating environment. The brush pigtail leads should be checked for secure connection to the brush support stud. Brushes should be replaced when their pigtails touch the top of the brush holder.

When replacing brushes, proper seating is important!

1. Wrap a strip of coarse grit (60#) sandpaper, rough side out, around the commutator and under the brush holder. (Do not use metal oxide based sandpaper or emery cloth that contains electrically conductive materials).
2. Slide the new brush into the holder and snap the spring clip in place.
3. Rotate the armature slowly in the direction of normal motor rotation.
4. Remove the brush and inspect the face. The brush should be seated over 90% of the face area and completely seated from leading to trailing edge.

Brushes should move freely in their holders. If brushes stick, it is usually due to built up dirt and oil. Brushes should be inspected on occasion to see that they are long enough to press firmly against the commutator. Brush springs should have equal tension. Only brushes of the same size, grade and shape as those originally supplied should be used.

All motors have their brushes set on neutral before leaving Baldor's factory. After replacing the brush holder, realign it to the factory neutral mark.

When replacing a turned-down commutator in the motor with a new commutator, the brush holder assembly must be adjusted. Keep 1/16" clearance between the bottom of the brush holder and commutator. The brush holder assembly is designed with a nut/bolt guide assembly for ease in positioning of the brush-box.

During periodic inspections, check that electrical connections are tight and properly insulated.

Brush Springs

Brush springs should be inspected for proper tension during brush replacement. If the spring shows a loss in tension, it should be replaced. Routine replacement of brush springs is recommended with every third set of brushes.

Poor Brush Life

Poor brush life may be caused by overloading, brushes operating at higher than their rated speed, or very light electrical loads. These can be corrected by using a brush with greater current-carrying capacity for overloads. Friction-reducing treatments reduce wear on high speed applications. Where light loading is the cause, the answer may be to remove some brushes from the motor (with multiple brushes per pole). Another is to install brushes with a higher content of graphite that can handle the lower current and still film properly. Poor brush life is generally not related to the "softness" or "hardness" of the brush.

Do not change brush grades or the number of brushes per pole. Doing so may void the warranty and make the motor unsafe to operate. Contact your local Baldor district office or an authorized Baldor service center for technical assistance.

Brush Chatter or Bounce

Brush chatter or bouncing can be caused by vibration from an external source. This may be a bad gearbox coupling or condition, or insecure mounting of the motor. Stronger carbon grades are available that provide more capacity for the brush to resist vibration. It is always best to fix the cause of the problem.

Brush Sparking

Excessive sparking of brushes may be due to electrical causes such as an overload or a very unstable DC power supply. Mechanical causes include a flat spot on the commutator or external vibration. Changing to a better brush grade, or a split-brush design may be required.

Carbon Brushes For Special Operating Conditions

Sometimes, there are problems if motor operation requires a different design or grade of carbon brush than what was installed when the motor was built. These special operating conditions include long periods of operation with loads that are significantly greater or less than rated load capacity. Also, operation in the presence of certain chemicals, or extreme temperature and humidity can degrade brush performance.

Generally, poor brush life or commutator wear can occur if one or more of the above conditions exist. The brush used doesn't match the operating conditions.

Baldor offers optional brush grades for the above conditions and has replacement brushes available to retrofit motors. Contact your local Baldor District Office or an Authorized Baldor Service Center for technical assistance.

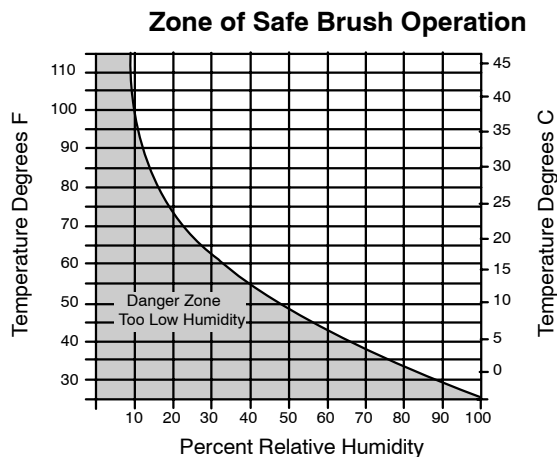
Do not change brush grades or the number of brushes per pole. Doing so may void the warranty and make the motor unsafe. Contact your local Baldor district office or an authorized Baldor service center for technical assistance.

Authorized Service

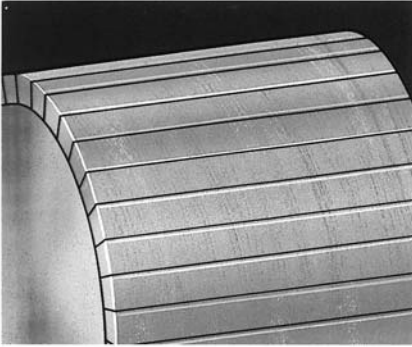
Baldor catalog 505 (and the Baldor CD-ROM) lists service shops authorized to service Baldor DC motors. Contact your local Baldor District Office for more information.

Humidity And Brush Wear

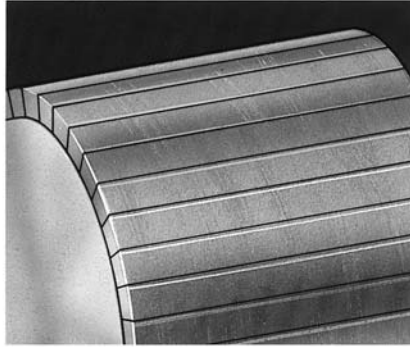
This curve represents 2 grains of water per cubic foot of dry air or 4.6 grams per cubic meter of dry air.



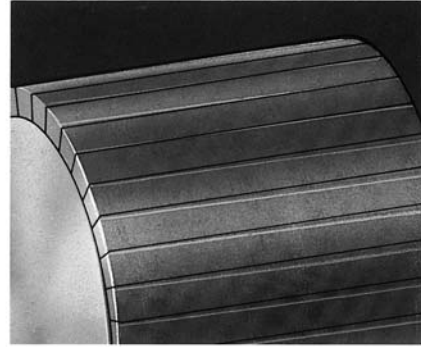
Guide To Commutator Appearance



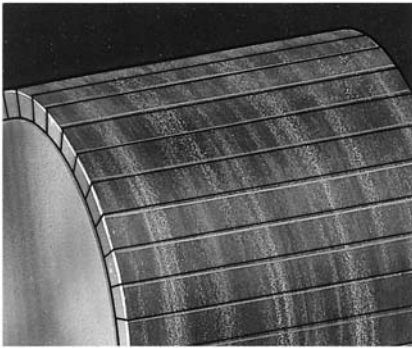
Light Film: Indicates good brush performance. Light load, low humidity, brush grades with low filming rates, or film reducing contamination can cause lighter color.



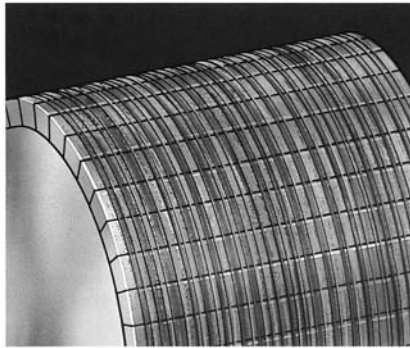
Medium Film: Is the ideal commutator condition for maximum brush and commutator life.



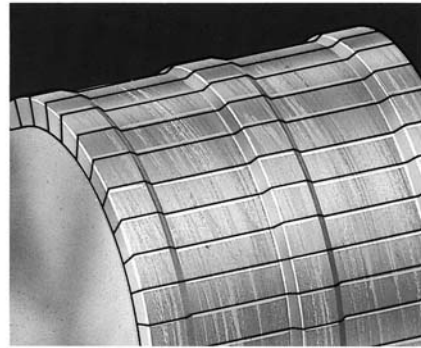
Heavy Film: Results from high load, high humidity or heavy filming rate grades. Colors not in the brown tones indicate contamination resulting in high friction and high resistance.



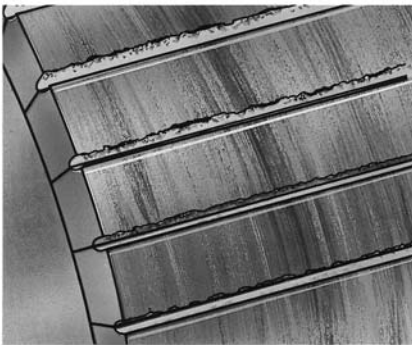
Streaking: Results from metal transfer to the brush face. Light loads and/or light spring pressure are most common causes. Contamination can also be a contributing factor.



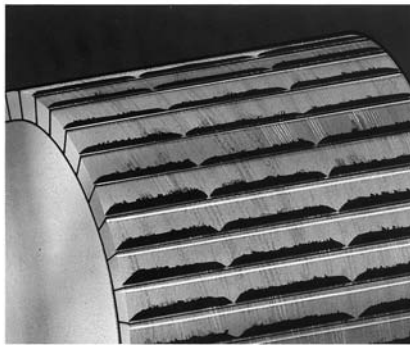
Threading: Is a further development of the streaking condition as the metal transferred becomes work hardened and machines into the commutator surface. With increased loads and increased spring pressure this condition can be avoided.



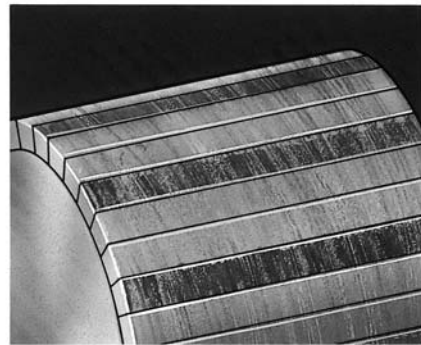
Grooving: May result from an overly abrasive brush grade. The more common cause is poor electrical contact resulting in arcing and the electrical machining of the commutator surface. Increased spring pressure reduces this electrical wear.



Copper Drag: Develops as the commutator surface becomes overheated and softened. Vibration or an abrasive grade causes the copper to be pulled across the slots. Increased spring pressure will reduce commutator temperature.



Bar Edge Burning: Results from poor commutation. Check that brush grade has adequate voltage drop, that the brushes are properly set on neutral and that the interpole strength is correct.



Slot Bar Marking: Results from a fault in the armature windings. The pattern relates to the number of conductors per slot.

This chart courtesy of Helwig Carbon Products, Inc., Milwaukee, WI

Commutator

After several hours of operation, the commutator surface under the brush should take on a darker bronze color. This is due to self-generated film caused by normal commutation. This coloration should be even, without blotches or black areas. A shiny copper color or black streaks in the brush tracks are signs of improper commutation or contamination by a foreign material. Contact Baldor for assistance in correcting these problems.

If the commutator becomes rough and burned, or becomes black, it should be cleaned of dirt and carbon particles. This can be done by wiping it with a dry, lint-free cloth. Also vacuuming or blowing out the motor with a dry air supply are suitable cleaning methods.

Do not use solvents or cleaning solutions on the commutator. To remove spots or contamination that will not wipe off, wrap a strip of coarse (60# grit) sandpaper around the commutator. Then rotate the armature back and forth by hand. **Do not use emery cloth as this contains electrically conductive materials.**

Another method of commutator resurfacing is to use a commercially available commutator dressing stone. This should only be done by trained and experienced people. This stone should be taped or attached to the end of a stick made of electrically insulated material. The motor should be run at about half speed and the stone applied lightly to the commutator surface. This operation must be done with no load on the motor.

The surface of the commutator should be smooth and round. This can be checked while the motor is running at low speed. Press lightly on one brush with an insulated stick. **Do not use a lead pencil as this contains electrically conductive graphite.** If you feel movement of the brush, it suggests a worn or uneven commutator. The armature must be removed from the motor and the commutator machined by a qualified repair shop.

Rapid Commutator Wear

Light electrical loads and contamination are the usual causes of rapid commutator wear. Light loading may require the removal of some brushes on motors with multiple brushes per pole. Sometimes a low current density brush grade is used. There are also brushes that have a mild polishing action. These prevent certain chemicals, especially chlorine and silicone, from attacking the commutator. Brushes, are available for use in plastic extruder applications where PVC is present. Usually, you do not have to change the design or grade of the brushes on new motors unless special operating conditions exist.

Do not change brush grades or the number of brushes per pole. Doing so may void the warranty and make the motor unsafe. Contact your local Baldor district office or an authorized Baldor service center for technical assistance.

Turning The Commutator

After commutator turning, check its run-out with the bearings on V blocks. For all commutators, maximum run-out is .002". New and minimum commutator diameters are listed as follows.

Commutator Brush Track Diameters		
Frame	New Motor Commutator Diameter (inches)	Minimum Diameter after Refinishing (inches)
180	2.750	2.51
210	4.500	4.29
250	5.000	4.72
280	5.750	5.45
320	6.500	6.20
360	7.500	7.21
400	8.250	7.90
500	10.250	9.72

Notes:

The above diameters are approximate.

They are for standard design and speed motors. high speed motors require larger minimum bar diameters. Contact Baldor for dimensions.

Commutator surface finish, after machining, should be between 40 and 65 micro-inch RMS.

Commutator Undercutting

Check the commutator mica between bars for an under-cut depth of 1/64" minimum, 5/64" maximum. The grooves of the under-cut are to be free of mica and chips.

⚠ Caution: Be very careful when repainting a drip proof motor. Do not get any paint on the commutator. Paint on the commutator will show up as black marks in brush tracks. Also, excessive brush sparking or erratic operation can be caused by paint or other material on the commutator.

Blowers & Filters

Do not use silicone RTV around DC motors as commutator surface damage can occur. Intake filters on blowers and louvers of drip proof motors should be cleaned to remove any dust or foreign matter. Canister type filters should be replaced when dirty. Failure to keep air intakes clear will cause overheating and premature failure of the insulating system.

Troubleshooting

Armature Overheating

Excessive overloads will cause a noticeable odor of overheated varnish or charred insulation. The commutator may eventually become blackened and pitted and the brushes burned. This overheating may be general and uniform. To cure, remove the overload and rewind or replace armature if damaged beyond use.

An open-circuited armature coil will cause flashing at the commutator. Two adjacent bars will show severe burning and a resulting overheated armature. Short-circuited coils or commutator bars may cause local heating that could destroy the insulation at that spot. This may result in the burning of the armature coils, banding or commutator bars.

Grounds in the armature circuit may be found by using a megger. Connect one lead to motor frame and the other lead to a commutator bar. If the armature is grounded, the megger will show less than 1 meg ohm.

These tests should be done by experienced and qualified personnel.

Field Coil Overheating

The blowers or external cooling systems should be left in operation if the main field windings remain fully energized with the motor at standstill. Failure to do so may cause too much heat build-up which could cause reduced insulation life.

When using field economy circuits to reduce voltage to the main fields during standstill, blowers do not need to be operating. The most common failure with overheated field coils is a short in one or more of the shunt coils.

Shorted coils show less than half the line voltage for two pole motors. This is with the fields connected for high voltage (in series). Shorted four pole motor coils will read less than 1/4 of the line voltage with the coils connected for high voltage (in series).

A grounded coil may cause overheating. This defect may be tested as shown by the ground test for an armature. With brushes lifted, place one test point of the megger on either field lead, the other on the motor frame. The megger will read less than 1 meg ohm, if a grounded coil is present.

An open field coil on a motor will cause the armature to have no torque. The motor may run at a very high speed at no load. The commutator may be flashing. To locate an open coil, apply line voltage to the shunt coils (brushes lifted). A voltmeter will show no reading across a good coil. It will show about the line voltage across the open coil.

These tests should be done by experienced and qualified personnel. If you find any of the above defects, don't run the motor. First contact your local Baldor District Office or an Authorized Baldor Service Center for repairs.

Excessive Load

Excessive load may be found by checking the DC armature ampere input and comparing it with the rating on the nameplate. An excessive load may prevent the motor from starting or accelerating to full load speed. It could finally result in premature failure of the motor or control. Be sure to use an averaging type ammeter if the motor's power is coming from a rectifier or SCR control.

Jogging and Repeated Starts

Repeated starts or jogs of motors may reduce the life of the brushes and winding insulation. The heat produced by excessive starting may be more than what can be dissipated by the motor under a constant full load conditions. If you must frequently start or jog a motor, you should check the application with the local Baldor District Office.

Heating

Duty cycle and maximum ambient temperature are shown on the nameplate of the motor. If there is any question about safe operation, contact the local Baldor District Office.

Motor overheating may be caused by improper ventilation, excessive ambient temperature, dirty conditions or an inoperable blower or dirty filter. Electrical causes may be due to excess current caused by an overload or over-voltage to the fields.

Thermostat

Most stock Baldor DC motors 180 frame and above have a standard temperature-sensing thermostat mounted to their interpole winding. This normally closed thermostat opens when the temperature limit is exceeded. Another option available is a normally open thermostat that closes with temperature.

On blower cooled or separately ventilated motors, the protection capabilities of the thermostats are greatly reduced at low speeds. This is because the interpoles have the same amount of heat transfer regardless of speed. Armature heat transfer is less at low speed. There is less internal air turbulence at low speeds causing higher temperatures at the armature.

The thermal time constant for interpoles can be as much as five times longer than the armature's time constant. Because of this, the thermostat cannot be relied upon to protect the armature during extreme overloads lasting a short time.

The ripple of the rectified power supply and manufacturing tolerances of mounting the device affect the thermostat's accuracy.

For thermostat contact ratings, refer to Thermostats in Section 2 of this manual.

Table 3-6 Troubleshooting Chart

Symptom	Possible Causes	Possible Solutions
Motor will not start	Usually caused by line trouble, such as, single phasing at the starter.	Check source of power. Check overloads, fuses, controls, etc.
Excessive humming	High Voltage.	Check input line connections.
	Loose pole pieces.	Torque the bolts as specified in Table 3-1.
Motor Over Heating	Overload. Compare actual amps (measured) with nameplate rating.	Locate and remove source of excessive friction in motor or load. Reduce load or replace with motor of greater capacity.
	Improper ventilation.	Check external cooling blower to be sure air is moving properly across cooling fins. Check blower for proper direction of rotation. Check motor brush covers to ensure they are solid on the commutator end and that they are not louvered. Check filter for dirt, clean or replace. Excessive dirt build-up on motor. Clean motor.
	Armature rubbing on stator.	Check air gap clearance and bearings.
		Tighten "Thru Bolts" that hold the endplates to frame. Torque the pole bolts as specified in Table 3-1.
	Field over voltage.	Check input voltage.
	Full voltage on field with motor stopped.	Reduce field voltage to 60% with field economy circuit in the control.
	Grounded winding.	Perform dielectric test and repair as required.
	Improper connections.	Inspect all electrical connections for proper termination, clearance, mechanical strength and electrical continuity. Refer to connection diagram.
Bearing Over Heating	Misalignment.	Check and align motor and driven equipment.
	Excessive belt tension.	Reduce belt tension to proper point for load.
	Excessive end thrust.	Reduce the end thrust from driven machine.
	Excessive grease in bearing.	Remove grease until cavity is approximately $\frac{3}{4}$ filled.
	Insufficient grease in bearing.	Add grease until cavity is approximately $\frac{3}{4}$ filled.
	Dirt in bearing.	Clean bearing cavity and bearing. Repack with correct grease until cavity is approximately $\frac{3}{4}$ filled.
Vibration	Misalignment.	Check and align motor and driven equipment.
	Rubbing between rotating parts and stationary parts.	Isolate and eliminate cause of rubbing.
	Armature out of balance.	Have armature balance checked and repaired at your Baldor Service Center.
	Resonance.	Tune system or contact your Baldor Service Center for assistance.
Noise	Foreign material in air gap or ventilation openings.	Remove armature and foreign material. Reinstall armature. Check insulation integrity. Clean ventilation openings.
Growling or whining	Bad bearing.	Replace bearing. Clean all grease from cavity and new bearing. Repack with correct grease until cavity is approximately $\frac{3}{4}$ filled.

Accessories

The following list shows some accessories available through Baldor's Mod Express or available on custom manufactured motors. Contact your Baldor supplier for information on each additional accessory or those listed below.

Bearing RTD

RTD (Resistance Temperature Detector) devices are used to measure or monitor the temperature of the motor bearing during operation.

Bearing Thermocouples

Used to measure or monitor bearing temperatures.

Bearing Thermostat

Temperature device that activates when bearing temperatures are excessive. Used with an external circuit to warn of excessive bearing temperature or to shut down a motor.

Blowers with Filters:

Available to increase the constant torque speed range of DPFM motors. This increases the continuous operating torque range at low speeds.

Brush Wear Indicator:

Provides a warning when the brushes have worn down to the level where they need to be replaced (before damage to the commutator).

Condensation Drains & Breathers:

Stainless steel drains and separate breathers are available.

Conduit Boxes

Optional conduit boxes are available in various sizes to accommodate accessory devices.

Cord & Plug Assembly

Adds a line cord and plug for portable applications.

Drip Covers

Designed for use when motor is mounted in a vertical position. Contact your Baldor distributor to confirm that the motor is designed for vertical mounting.

Fan Cover & Lint Screen

To prevent build-up of debris on the cooling fan.

Nameplate

Additional stainless steel nameplates are available.

Roller Bearings

Recommended for belt drive applications with a speed of 1800 RPM or less.

Rotation Arrow Labels

Rotation arrows are supplied on motors designed to operate in one direction only. Additional rotation arrows are available.

Slide Bases:

Allows easy belt adjustment while maintaining correct pulley and belt alignment.

Space Heater

Added to prevent condensation of moisture within the motor enclosure during periods of shut down or storage.

Stainless Hardware

Stainless steel hardware is available. Standard hardware is corrosion resistant zinc plated steel.

Tachometers:

DC, AC and digital outputs are available. These can be mounted to our motors or shipped separately. Tachs help the SCR control achieve more precise speed regulation than by armature feedback alone.

Transparent Brush Inspection:

For easy brush inspection and commutation monitoring without disassembly of the motor.

Winding RTD

RTD (Resistance Temperature Detector) devices are used to measure or monitor the temperature of the motor winding during operation.

Winding Thermocouples

Used to measure or monitor winding temperatures.

Winding Thermostat

Temperature device that activates when winding temperatures are excessive. Used with an external circuit to warn of excessive winding temperature or to shut down a motor.

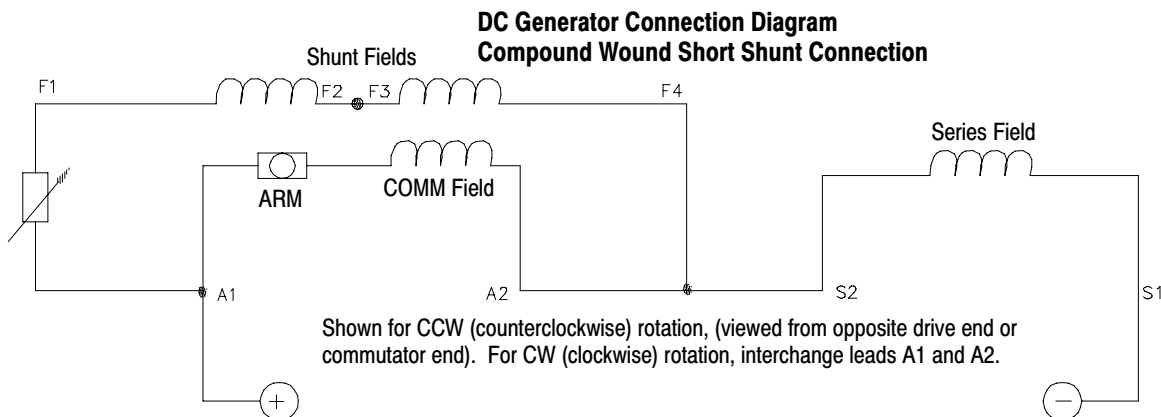
Reflash Instructions

Instructions to reflash the residual magnetism for **Lifting Magnet Generators only**.

These generators are self-exciting. If voltage will not build up, it is possible the residual magnetism is insufficient to initiate excitation. This procedure is to restore sufficient residual magnetism to self excite.

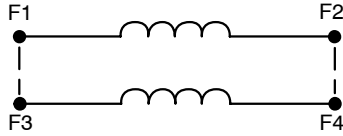
Note: Loss of residual magnetism can be caused by misconnection (reversing the connections) of F1 and F4.

1. Disconnect F1 and F4. All other leads may remain connected.
2. Connect 24 to 40VDC power source positive lead to F1 and negative to F4. DC source may be batteries, a DC welder (not AC) or rectified AC.
3. Drive generator at rated RPM.
4. Measure the voltage across A1 and A2. Voltage should be 150 to 200% of F1 to F4 voltage. When A1 to A2 voltage level reaches this level (approximately 30 seconds) carefully remove the source leads, an arc may be present during disconnect.
5. Stop the generator.
6. Reconnect F1 and F4 as shown in the DC Generator Connection Diagram. Rotation is viewed from opposite drive end (commutator end) A1 is positive for CCW rotation. A2 is positive for CW rotation. S1 is always negative.

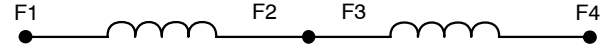


Section 4 Connection Diagrams

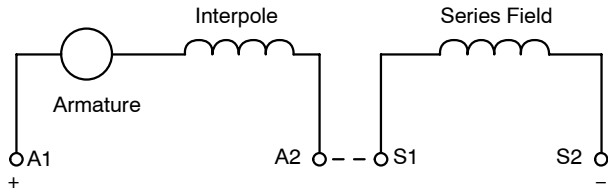
Low Voltage connection Shunt Field



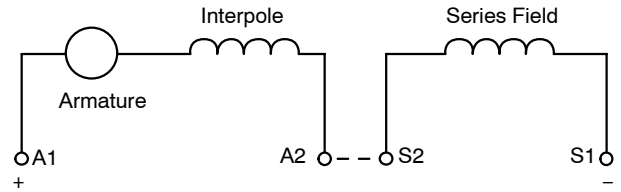
High Voltage connection Shunt Field



Field Reversing Series Motor

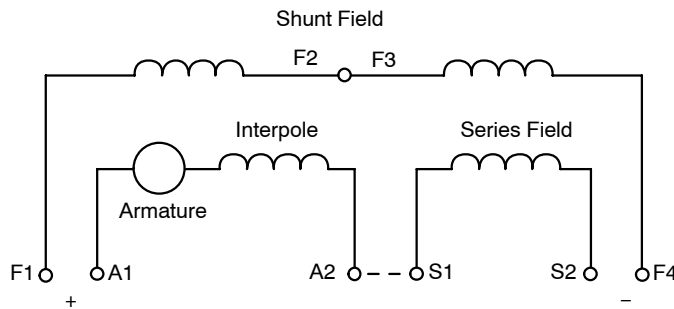


Series Motor CCW Rotation
(Facing Commutator End)

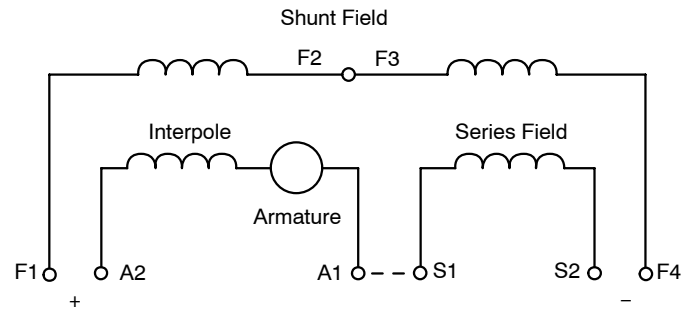


Series Motor CW Rotation
(Facing Commutator End)

**Armature Reversing
Compound and Stabilized Motors**

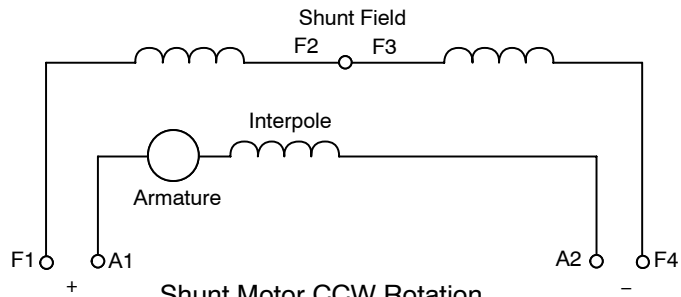


Compound or Stabilized Shunt Motor
CCW Rotation (Facing Commutator End)
High Voltage Field Connection



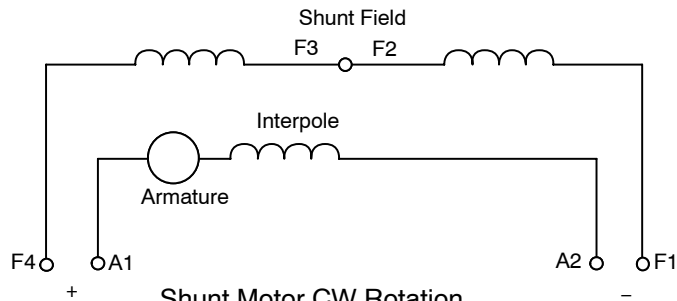
Compound or Stabilized Shunt Motor
CW Rotation (Facing Commutator End)
High Voltage Field Connection

Field Reversing Shunt Motor



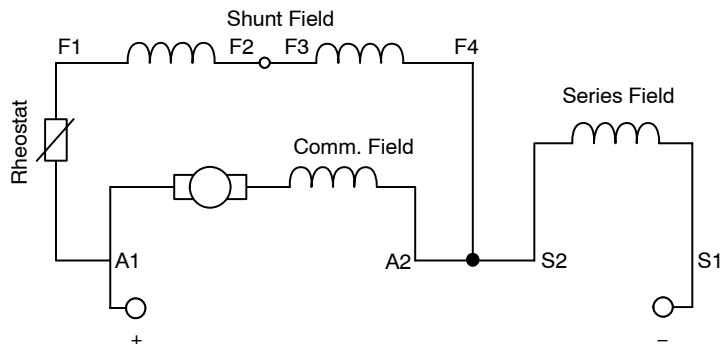
Shunt Motor CCW Rotation
(Facing Commutator End)
High Voltage Field Connection

Field Reversing Shunt Motor



Shunt Motor CW Rotation
(Facing Commutator End)
High Voltage Field Connection

DC Generator Connection Diagram Compound Wound Short Shunt Connection



CCW Rotation
(Facing Commutator End)
For CW Rotation, Interchange Leads A1 and A2.

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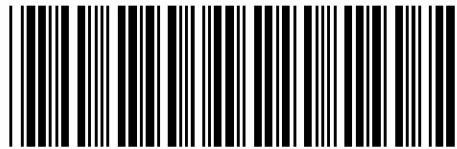
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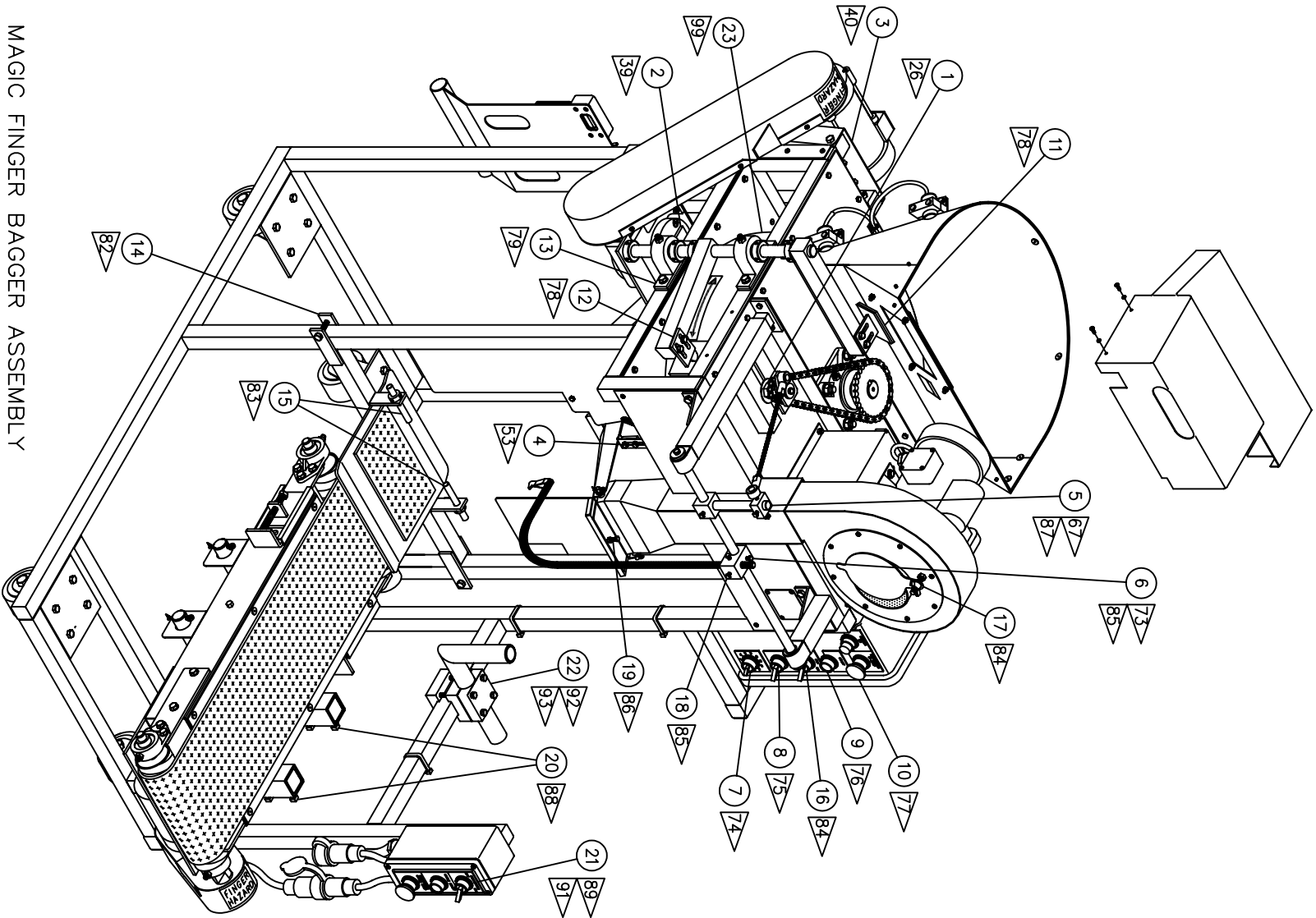


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BALDOR ELECTRIC COMPANY
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Ft. Smith, AR 72901-2400
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Fax (479) 648-5792

Spare Parts List				
Item #	Qty	Description	Assembly dwg #	Matthiesen Part #
20	1	Wicket Rod Weldment	B0000	MFBAGR032
43	1	Chain Tensioner	B0000	MFBAGR166
44	1	Extension Spring	B0000	MFBAGR182
47	3	Cam Follower	B0000	MFBAGR016
51	1	V Belt	B0000	VB027
5	1	Bottom Proximity Switch	B0041	PT927
6	1	Top Proximity Switch	B0041	PT928
3	1	Air Filter for Blower	B0042	PT655
46	1	Flywheel Weldment	B0000	MFBAGR051
13	2	Square Head Set Screw	B0043	*
16	2	Flange Bushing	B0043	MFBAGR052
17	2	Flange Bushing	B0043	MFBAGR052
20	2	Flange Bushing	B0043	MFBAGR052
7	2	Rubber Impact Pad on Sure Fall Paddle	B0044	VB482
6	1	Metering Door Axle on Ice/Air Chute	B0047	MFBAGR181
7	2	Flange Bushing on Ice/Air Chute	B0047	MFBAGR052
8	2	Cotter Pins Ice/Air Chute	B0047	*
9	1	Extension Spring for Ice/Air Chute	B0047	SPR101
16	2	#40 Roller Chain Master Link for Conveyor Assembly	B0050	PT059
21	4	Flanged Bearing Bracket for Conveyor Assembly	B0050	MBBELT015
41	2	Square Head Set Screw	B0050	*
24	2	30 Amp Fuse for Back Panel	B0053	*
25	4	12 Amp Fuse for Back Panel	B0053	*
2	2	Gravity Weight PE Block	B0058	MFBAGR188



ADJUSTMENT MAINTENANCE SCHEDULE	
ITEM	ADJUSTMENT AND/OR MAINTENANCE
1	MAGIC FINGER CHAIN TENSION ADJUSTMENT
2	MAIN DRUM CHAIN TENSION ADJUSTMENT
3	MAIN DRIVE BELT TENSION ADJUSTMENT
4	ICE/AIR DOOR CLOSED STOP MAINTENANCE
5	DRIVE LEVER ATTACHMENT BLOCK MAINTENANCE
6	MAGIC FINGER WAND BLOCK MAINTENANCE
7	SYSTEM SPEED CONTROL SELECT MAINTENANCE
8	MANUAL/AUTOMATIC SELECT MAINTENANCE
9	SYSTEM START BUTTOM MAINTENANCE
10	SYSTEM STOP BUTTOM MAINTENANCE
11	SURE FALL HOPPER IMPACT PAD
12	SURE FALL DRUM IMPACT PAD
13	SURE FALL CAM TIMING ADJUSTMENT
14	BAG SHELF HEIGHT ADJUSTMENT
15	BAG RETAINER SPACING ADJUSTMENT
16	BLOWER FAN ON/OFF SELECT MAINTENANCE
17	BLOWER AIR AMOUNT ADJUSTMENT
18	WAND HEIGHT ADJUSTMENT
19	ICE/AIR CHUTE DOOR OPEN STOP MAINTENANCE
20	CONVEYOR HEIGHT/ANGLE ADJUSTMENT
21	CONVEYOR ON/OFF SELECT MAINTENANCE
22	RING CLOSER MOUNT ADJUSTMENT
23	VOLUMETRIC DRUM ADJUSTMENT

MAGIC FINGER BAGGER ASSEMBLY
ADJUSTMENT / MAINTENANCE SCHEDULE

NOTES:

MATTHIESEN EQUIPMENT INC.

566 N. W.W. White Road

San Antonio, TX 78219

OFC: (210) 333-1510 FAX: (210) 333-1563

TOLL: +1 (800) 624-8635

www.matthiesenequipment.com

MATTHIESEN
SAN ANTONIO, TEXAS

ADJUSTMENT/MAINTENANCE SCH.

PART NAME
& NUMBER
DWG. DESC.

ENGINEER

PLANT CODE DESIGN

NTS

ORIGIN

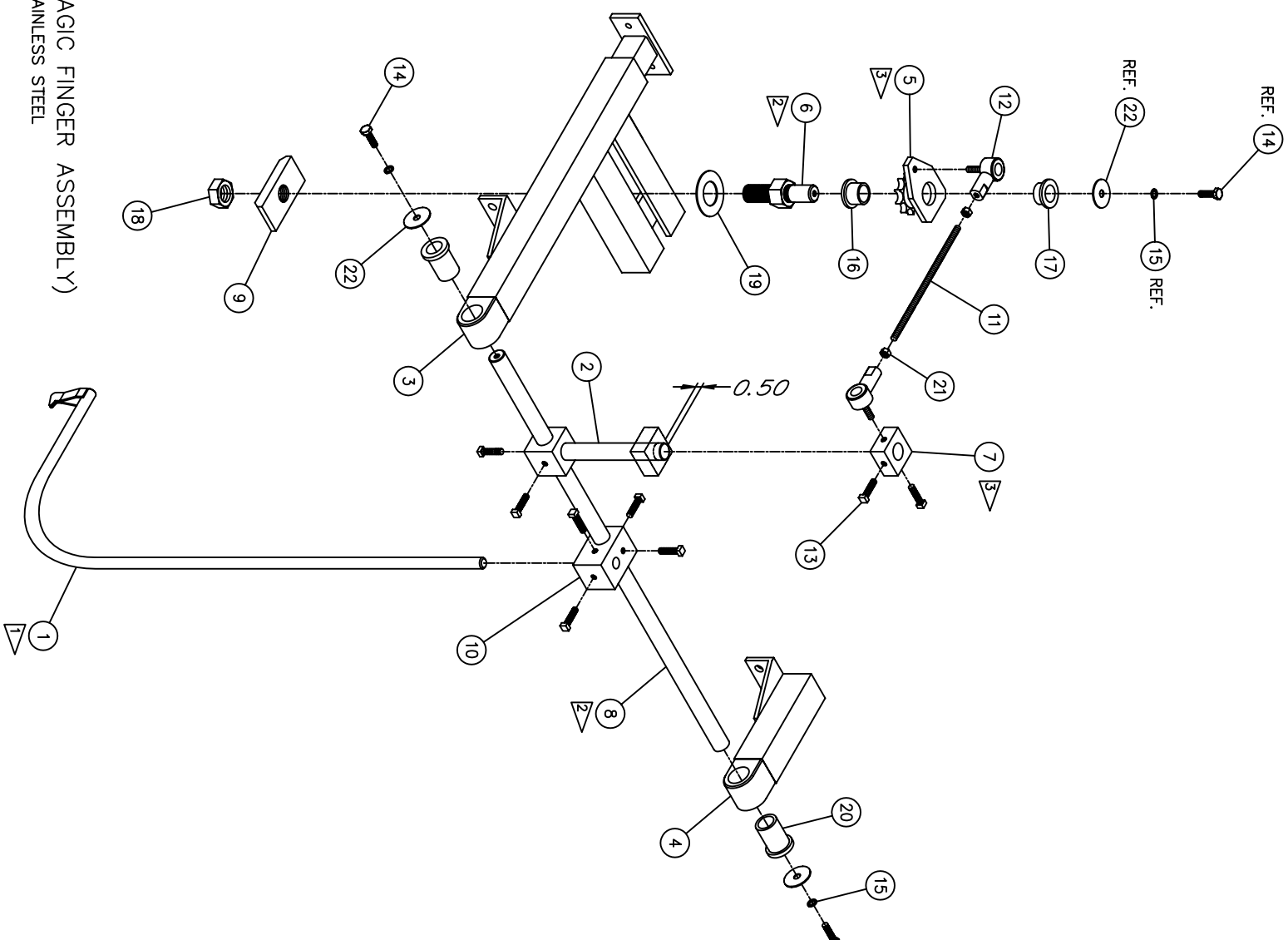
MEI

CATEGORY

SA

DRAWN

POUNDS



- NOTES:
1. FINAL ADJUSTMENT OF ITEM 1, WAND WELDMENT TO BE DONE AT TOP ASSEMBLY LEVEL.
 2. LUBRICATE BEARING CONTACT SURFACES (ENDS OF SHAFT) AT ASSEMBLY.
 3. NOTE POSITION OF ITEM 5, FLYWHEEL AND RELATIVE POSITION OF ITEM 2, DRIVE LEVER WELDMENT WHEN TOP OF ITEM 7, DRIVE SHAFT ATTACHMENT BLOCK IS LOCATED AS SHOWN.

B-0043-A (MAGIC FINGER ASSEMBLY)
STAINLESS STEEL

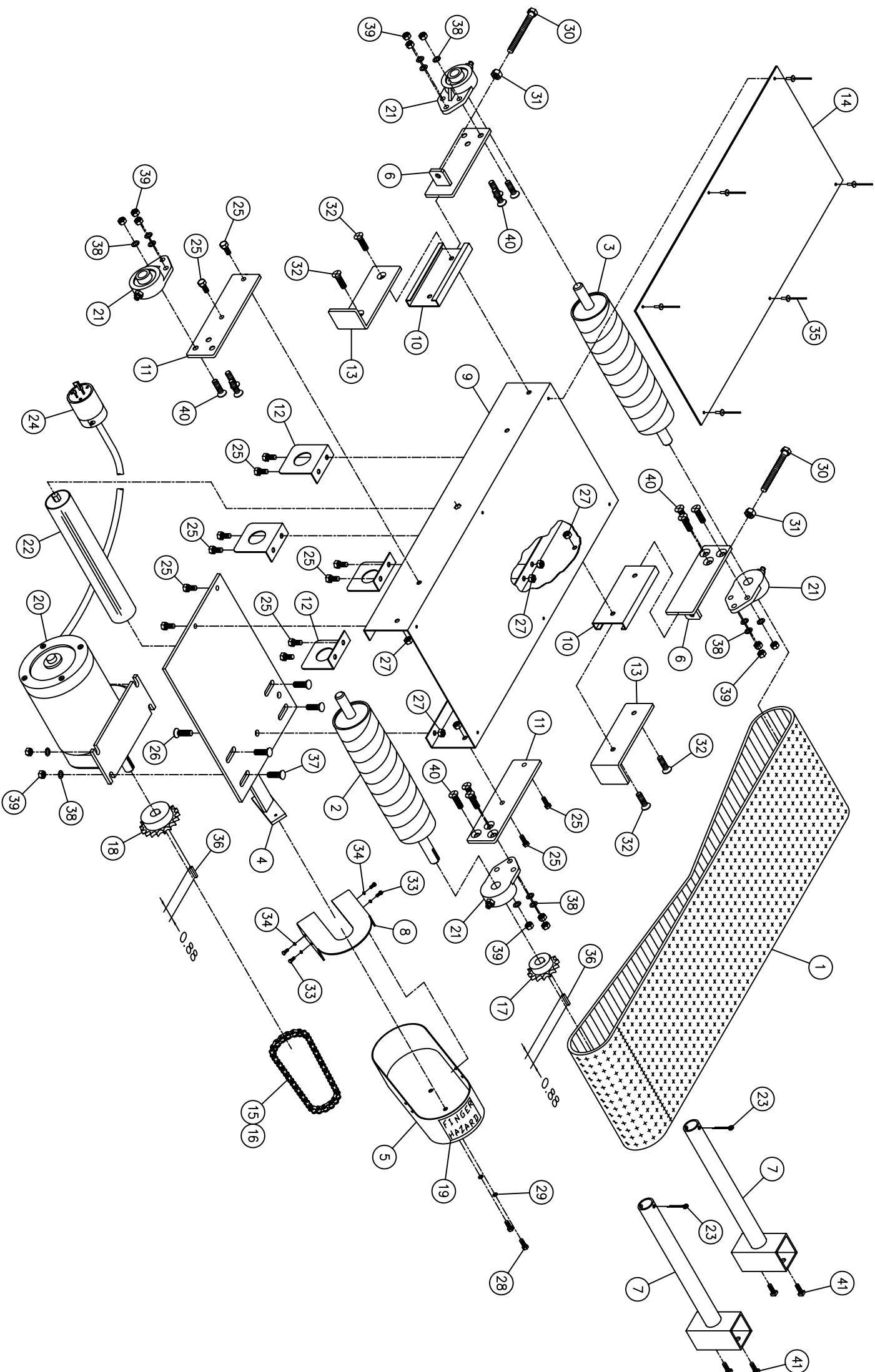
NOTES:



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MATTTHIESEN									
SAN ANTONIO, TEXAS									
PART NAME									
& NUMBER									
DWG. DESC.									
MAGIC FINGER ASSEMBLY									
ENGINEER									
SCALE		NTS		ORIGIN		CATEGORY		PLANT CODE	
				MEI		S		SA	
						DRAWN		DESIGN	
						CHECKED		MEI	
						APPROVED		MEI	
B-0043-A									



B-0050-A (10.00" x 36.00" CONVEYOR ASSEMBLY)
STAINLESS STEEL

NOTES:

MATTHIESEN EQUIPMENT INC.

566 N. W.W. White Road

San Antonio, TX 78219

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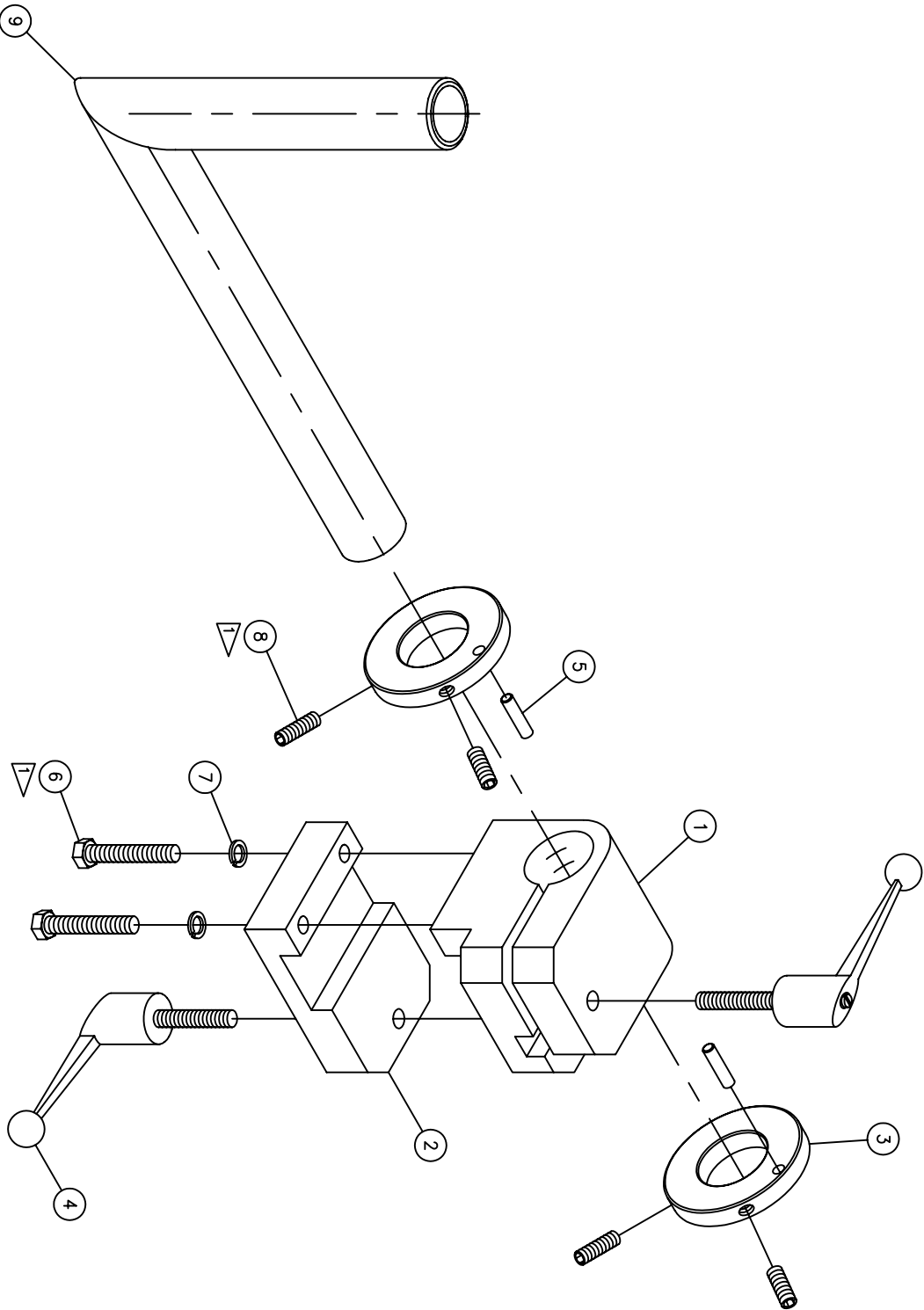
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MATTHIESEN									
SAN ANTONIO, TEXAS									
PART NAME		MFBELT020							
& NUMBER									
DWG. DESC.									
310 BELT CONVEYOR ASSEMBLY									
ENGINEER		SCALE		NTS		ORIGIN		MEC	
PLANT CODE		DESIGN		MEC		CATEGORY		SA	
DRAWN		POUNDS		CHECKED		APPROVED		MEC	

NOTE:
LEAVE HARDWARE LOOSE FOR NOW.
FINAL ADJUSTMENT AND TIGHTENING
IS DONE AT TOP ASSEMBLY LEVEL.



B-0088-A (PIVOTING HAMER 125 MOUNTING ASSEMBLY)

NOTES:									
									
MATTHIESEN EQUIPMENT INC. 566 N. W.W. White Road San Antonio, TX 78219 OFC: (210) 333-1510 FAX: (210) 333-1563 TOLL: +1 (800) 624-8635 www.matthiesenequipment.com									
		</							

MAGIC FINGER PARTS LIST

Item	QTY	REF #	DESCRIPTION	PART #
1a	1	B-0041-A	Std Hopper Assembly S.S.	MFBAGR104
1b	1	B-0041-A	Top Hopper UHMW Liner	BAGR426
2	1	B-0042-B	Blower Assembly S.S. – 120/1/60	MFBAGR209
3	1	B-0043-A	Magic Finger Assembly S.S.	MFBAGR102
4	1	B-0044-B	Sure-Fall Assembly S.S.	MFBAGR012
5	1	B-0045-A	Drum, Volumetric, Assembly, SS	MFBAGR211
6	1	B-0046-B	Enclosure, Control, Magic Finger Assembly	MFBAGR159
7	1	B-0004-A	Magic Finger Main Frame SS Weldment	MFBAGR180
8	1	B-0004-B	Magic Finger Guard Enclosure SS Weldment	*
9	1	B-0047-B	Ice/Air Chute Assembly SS	MFBAGR210
10	1	B-0048-A	Magic Finger Guard SS Assembly	MFBAGR223
11	1	B-0036-A	Magic Finger Main Belt Assembly	MFBAGR187
12	1	B-0036-B	Motor Mount Weldment SS	MFBAGR132
13	1	B-0058-A	Gravity-Weight Assembly SS	MFBAGR001
14	1	B-0037-A	Snow Canopy Weldment SS	MFBAGR030
15	1	B-0037-C	6” SS Bag Wicket Weldment	MFBAGR111
16	1	B-0056-A	Hamer 125 Mounting Assembly	MFBAGR204
17	1	B-0049-B	Conveyor Control Enclosure Assembly (incl'd on item 6)	*
18	1	B-0050-A	10x36 SS Conveyor Assembly (See Appendix A)	MFBELT020
19	1	B-0040-C	SS Bag Shelf Assembly	MFBAGR108
20	1	B-0010-D	SS Wicket Catch Support	MFBAGR233
21	1	P-000056	Serial Number Label/3x5 Aluminum Name Plate	*
22	1	P-000034	Finger Hazard Chain Label/Belt Guards	*
23	1	B-0007-I	Chain Clip/SS Frame	*
24	1	B-0008-E	SS Reducer Plate	MFBAGR186
25	1	B-0010-F	SS Chain Tensional Bracket	MFBAGR234
26	1	B-0011-C	SS Snow Shield	MFBAGR031
27	1	B-0019-F	SS Belt Guard Back Lg (incl'd on item 11)	*
28	1	B-0019-B	SS Belt Guard Back Sm (incl'd on item 11)	*
29	1	B-0014-B	Polyethylene Lower Bearing Plate	MFBAGR244
30	1	B-0012-C	Lower Bearing Plate SS	MFBAGR017
31	1	B-0019-A	Polyethylene Top Drum Plate	*
32	1	B-0012-A	SS Top Bearing Plate	MFBAGR094
33	1	B-0012-B	SS Short Bearing Plate	*
34	1	B-0015-B	SS Left Front Guard	MFBAGR129
35	1	B-0015-C	SS Right Front Guard	MFBAGR130
36	1	B-0005-B	Modified Steel Sprocket 40T-#40x1.5” Bore	SPR093
37	1	P-000046	Steel Sprocket 30T-#40x1.5” Bore	SPR102
38	2	P-000047	1.5” 4 Hole Flange Bearing	BRG016
39	1	P-000048	Right Angle Reducer 1725x45 RPM	MTR031

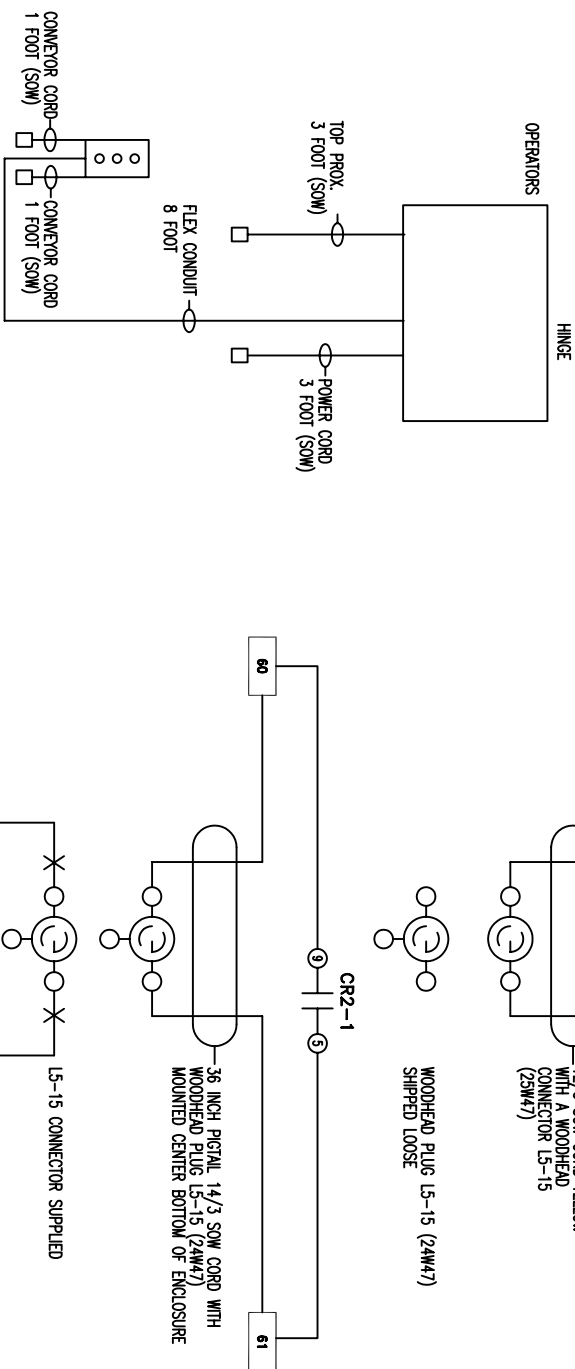
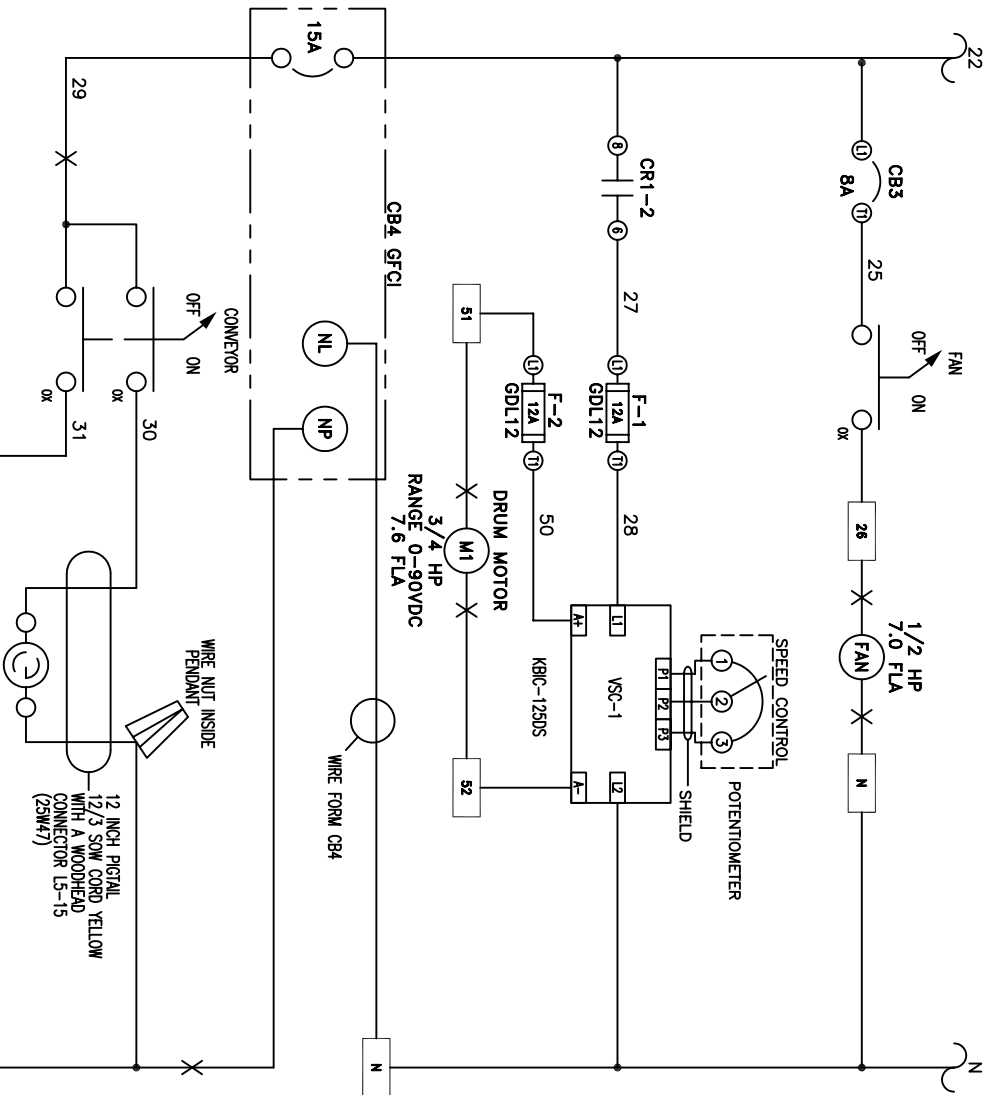
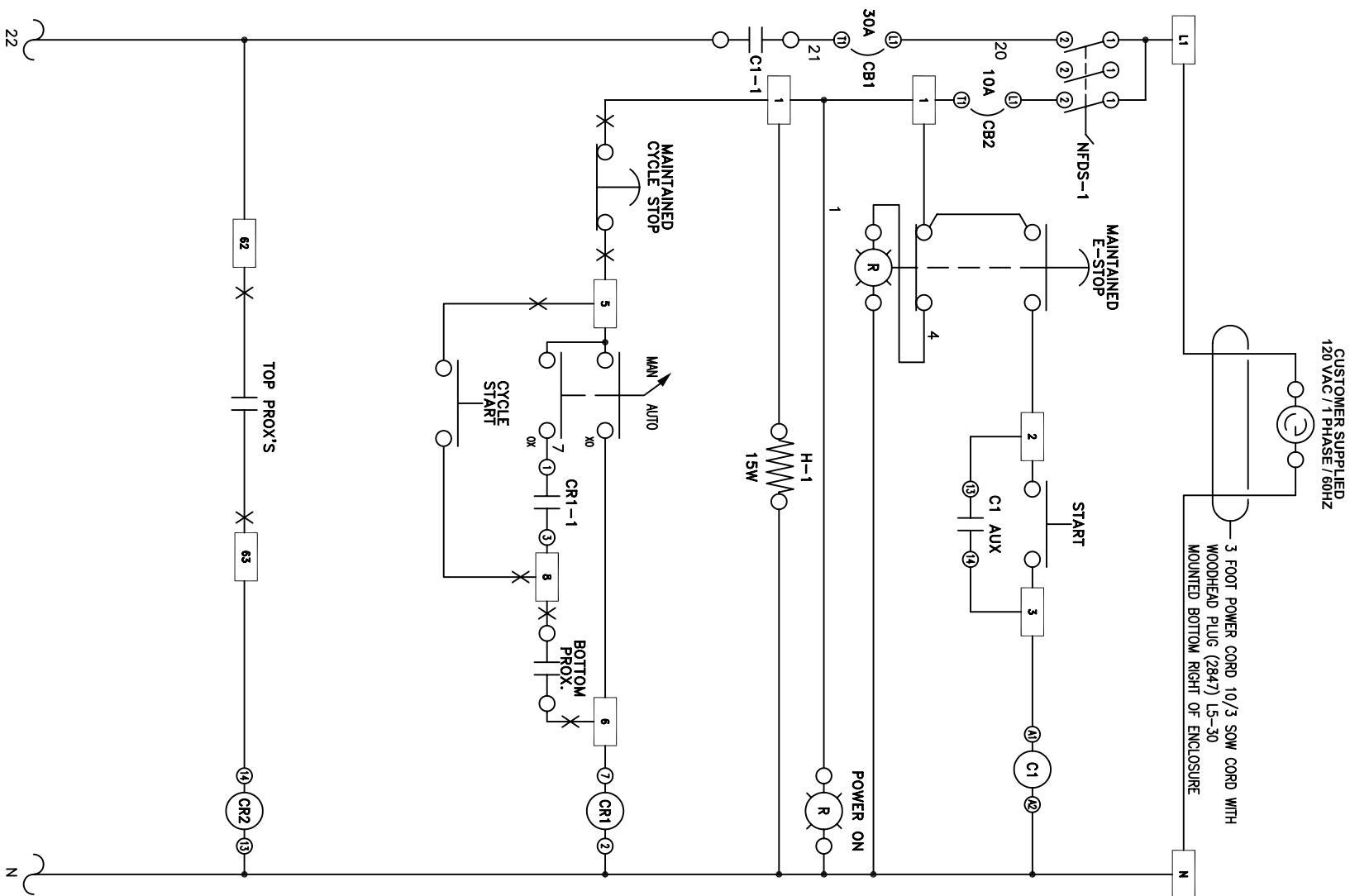
40	1	P-000049	¾ HP Motor	MTR325
41	3.66	P-000029	Roller Chain #40 ½ Pitch	VB057
42	2	P-000030	Roller Chain Connecting Link #40 ½ Pitch	PT059
43	1	P-000050	HD Roller Chain Tensioner #40	MFBAGR166
44	1	P-000051	Extension Spring .105Ø wire x 1.00 OD x 7.5" LG	MFBAGR095
45	4	P-000052	4"Ø x 2" W Casters	PT926
46	1	B-0018-C	SS Bagger Cam Plate	MFBAGR140
47	3	P-000011	Cam Follower 1.25"Ø x ¾ - UNC-2A Shank	MFBAGR016
48	.5	P-000042	SS Safety Chain 410 Work Load	*
49	2	P-000053	6206k33 Combination Single Groove Pulley	PLY018
50	1	P-000031	Sprocket 14T-#40 x .75Ø Bore	SPR101
51	1	P-000057	B43 46" LG B Section Rubber V Belt	VB027
52	25	F0401036	SS Hex Head Cap Screws ¼"-20 UNC-2A x2.25" LG	*
53	4	F0401016	SS Hex Head Cap Screws ¼"-20 UNC-2A x1.00" LG	*
54	23	F0400004	SS ¼"Ø Flat Washer	*
55	39	F0400002	SS Nylon Self Locking Hex Nut ¼"-20 UNC-2B	*
56	4	F0503020	Phillips Flat Head Cap Screw 5/16" -18 UNC-2Ax1.25" LG	*
57	13	F0500002	SS Nylon Self Locking Hex Nut 5/16"-20 UNC-2B	*
58	8	F0501036	SS Hex Head Cap Screws 5/16"-20 UNC-2A x2.25" LG	*
59	7	F0500005	5/16" SS Lock Washer	*
60	8	F0401012	SS Hex Head Cap Screws ¼"-20 UNC-2A x.75" LG	*
61	20	F0601016	SS Hex Head Cap Screws 3/8"-20 UNC-2A x1.00" LG	*
62	20	F0600004	SS ¾"Ø Flat Washer	*
63	7	F0600005	¾" SS Lock Washer	*
64	4	F0401032	SS Hex Head Cap Screws 1/4"-20 UNC-2A x2.00" LG	*
65	10	F0400005	¼" SS Lock Washer	*
66	25	F0302008	Pan Head Cap Screw Phillips #10-32UNF-2Ax.5" LG	*
67	29	F0300005	#10 SS Lock Washer	*
68	2	F0601032	SS Hex Head Cap Screws 3/8"-16 UNC-2A x2.00" LG	*
69	18	F0600002	SS Nylon Self Locking Hex Nut ¾"-16 UNC-2B	*
70	1	F0601040	SS Hex Head Cap Screws 3/8"-16 UNC-2A x2.50" LG	*
71	1	F0600000	SS Hex Nut ¾"-16UNC-2B	*
72	4	F0401008	SS Hex Head Cap Screws ¼"-20 UNC-2A x.5" LG	*
73	4	F0306016	SS Socket Head Cap Screw #10-32UNF-2A x 1.00 LG	*
74	4	F0300002	SS Nylon Self Locking Hex Nut #10-32UNF-2B	*
75	As req'd	P-000017	Food Grade Anti Seize Compound	*
76	9	F0501016	SS Hex Head Cap Screws 5/16"-18 UNC-2A x1.00" LG	*
77	11	P-000043	SS Pop Rivets .125x.375 Long Grip	*
78	2	P-000028	SS Pop Rivets .188x.375 Long Grip	*
79	4	F0801032	SS Hex Head Cap Screws ½"-13 UNC-2A x2.00" LG	*
80	12	F0800004	SS ½"Ø Flat Washer	*
81	8	F0800002	SS Nylon Self Locking Hex Nut ½"-13UNC-2B	*
82	4	F0803032	SS Hex Head Cap Screws ½"-13 UNC-2A x2.00" LG	*

83	11	F0500004	SS 5/16"Ø Flat Washer	*
84	2	F0401024	SS Hex Head Cap Screws ¼"-20 UNC-2A x 1.5" LG	*
85	3	F0601020	SS Hex Head Cap Screws 3/8"-16 UNC-2A x1.25" LG	*
86	1	P-000045	SS Keyway 3/8x12" LG	*
87	1	P-000033	SS Keyway 3/16x12" LG	*
88	5	P-000060	Nylon Tie Cable	*
89	As req'd	P-000059	RTV Black Silicone	*
90	1	B-0060-A	Magic Finger Shipping Materials	*

10 X 36 SS Conveyor Assembly Individual Parts List

APPENDIX A

Item	QTY	DESCRIPTION	PART #
1	1	3 x 12 Idler Pulley	MFBELT001
2	1	3 x 12 Drive Pulley	MFBELT002
3	1	2" Spring Loaded Idler Pulley	MFBELT003
4	1	¾ x 18 Drive Shaft	MFBELT004
5	1	¾ x 16- ½ Idler Shaft	MFBELT005
6	2	SS Conveyor Support Arm	MFBELT009
7	1	Conveyor Drive Chain	MFBELT010
8	1	3' Conveyor Body 304 SS	MFBELT011
9	1	Conveyor Motor Mount SS	MFBELT012
10	1	Conveyor Chain Guard 304 SS	MFBELT013
11	2	Conveyor Drive Bearing Bracket	MFBELT014
12	2	Conveyor Idler Bearing Bracket	MFBELT015
13	1	3' Conveyor Body Liner HDPE	MFBELT016
14	1	3' Conveyor Belt with Lace	MFBELT017
15	4	Conveyor Support Arm Bracket	MFBELT018
16	1	.500-.625 Strain Relief Connector	PT370
17	4	14-3 Yellow Wire 250' Roll Cord	PT403
18	1	15A 125 V Twist Lock L5-15P Plug	PT437
19	1	40 BS14 x ¾ Sprocket	SPR101
20	1	40BS18 x ¾ Sprocket	SPR103
21	4	¾ 3 Bolt Bearing	BRG074
22	1	¼ hp-60 hz-115V-Ratio 2 Gearmotor	MTR055



UNLESS OTHERWISE NOTED ON
DRAWING ALL TOLERANCES
TO BE AS FOLLOWS
FRACTIONAL SIZES $\pm 1/64$
DECIMAL SIZES $\pm .005$
ANGLES $\pm 1/4^\circ$
BREAK ALL SHARP EDGES

MF BAGGER 159 WORK ORDER# 1818 WIRING SCHEMATIC				
SIZE  SCALE	DWG NO E504 NTS	REV C	DATE OF LAST REVISION 03/10/06 FILE NAME E06-196	BY BSW

MF BAGGER 159
WORK ORDER# 1818
WIRING SCHEMATIC

DRWG UNITS: INCHES

PLOT UNITS: INCHES

PLOT SCALE: 1=1

DRAWN
MAC

ISSUED 03/10/06

CLEANING AND SANITIZING INSTRUCTIONS

Equipment: The Matthiesen Magic Finger Bagger

Materials Required

- ❖ Water hose with spray nozzle attached to potable water source.
- ❖ Pressurized detergent spray unit with application hose and spray nozzle.
- ❖ Portable, hand operated pressure sprayer (2-3 gallon size).
- ❖ Auxiliary equipment: Brooms and brushes, sponges, wipes and plastic sheets to cover sensitive equipment.
- ❖ Personnel/supplies – plastic or rubber gloves, boots, head cover, aprons/coveralls, eye safety glasses.
- ❖ Moderately alkaline detergent (Mix per vendor instructions)
- ❖ Sanitizer: Quaternary ammonium

Special Instructions

- ❖ Avoid eye and skin contact with chemicals
- ❖ Maintain adequate ventilation.

Recommended Frequency of Cleaning

- ❖ Recommended weekly or more often, if necessary.

Procedure

- ❖ Remove residual ice and drain.
- ❖ Shut down and lock out unit (electrical).
- ❖ When essential, hand- clean the motor and controls and cover with plastic sheets.
- ❖ Rinse inside walls, breakers, and exterior with potable water.
- ❖ Spray the detergent solution on all pre-rinsed surfaces with detailed brushing, as required, until free of debris.
- ❖ Rinse free of detergent with warm water (< 130°F) and inspect for cleanliness. Repeat cleaning and rinsing until thoroughly clean.

Note: It may be necessary to turn on the bagger, applying detergent and rinsing alternatively to obtain thorough cleaning.

- ❖ Spray sanitizer (quaternary ammonium) at 200 ppm on drum and interior housing and allow to dry.
- ❖ Leave unit locked out until the next shift's operation.



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1-800-624-8635

MATTHIESEN, warrants this equipment to be free from defects in material and workmanship under normal use and service as follows:

90 DAYS WARRANTY ON ALL PARTS: 90 Days from date of purchase to the original purchaser, **MATTHIESEN** will at it's election, repair or replace at our factory in San Antonio, Texas, such part or parts found by the manufacturer to be defective. Any part or parts of equipment sent to us for adjustment, repair or replacement, will be shipped with all transportation charges prepaid, and will be returned to the customer with all transportation charges collect.

If owner elects to have any malfunctions repaired without the consent of **MATTHIESEN** during the Warranty Period, **MATTHIESEN** will exchange only the part or parts found by our factory to be defective with new or factory reconditioned parts. No allowance for labor, transportation or product loss will be allowed.

THIS WARRANTY shall not apply to said equipment, or any part thereof, which has been subject to accident, negligence, abuse, misuse, damage by flood, fire, windstorm, or any acts of God.

THIS WARRANTY shall not be deemed to place any liability on **MATTHIESEN** for labor, time loss, and product loss or replacement part purchased by owner without the consent of **MATTHIESEN**. **MATTHIESEN** shall be obligated hereby to furnish only the replacement part or parts.

MATTHIESEN, disclaims all other warranties, expressed or implied, including warranties of merchantability and of fitness for a particular purpose. Under no circumstances shall **MATTHIESEN** be liable or responsible for initial or consequential damages caused by any defects in materials workmanship, or by failure to adhere to any warranties.

MATTHIESEN
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San Antonio, Texas 78219
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Fax: 210-333-1563 1-800-624-8635 Phone: 210-333-1510

DECAL REORDER SHEET

DECAL NUMBER

DECAL IDENTIFICATION

D001



D002



D003



D004



D005



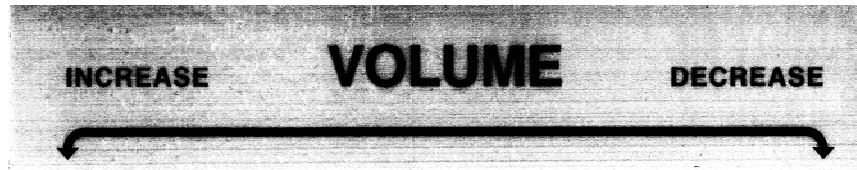


DECAL REORDER SHEET

DECAL NUMBER

DECAL IDENTIFICATION

D006



D007



D008



D009

